Original Article

Oral health status, treatment needs, and patterns of utilization of dental services among village volunteers in Andhra Pradesh: A cross-sectional multi-stage cluster survey

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Abstract

Background: Community health depends on the leadership duties of a diverse population, such as village volunteers. Hence, a study was conducted to assess oral health status, treatment needs, and patterns of utilization of dental services among village volunteers in Andhra Pradesh state. **Methodology:** A cross-sectional study was conducted among 400 village volunteers in Andhra Pradesh state, India. A multi-stage cluster sampling procedure was employed in sample selection. A questionnaire was used to review the pattern of utilization of dental services. World Health Organization Oral Health assessment form 1997 was used to evaluate oral health status and treatment needs. Data collected were analyzed using IBM SPSS Statistics for Windows, Version 25.0. Descriptive statistics were done. **Results:** Out of 400, 18% had never visited the dental clinic in their lifetime. The majority (33.5%) considered that dental problems were not a serious concern. Dental caries was seen in 69.5%, and 78.5% were presented with periodontal conditions. About 19.8% and 24.3% had crowding and spacing in incisal segments, respectively. The prevalence of oral mucosal disorders and dental fluorosis was 4.25% and 8.75%, respectively. Overall, 94% of the study participants needed dental treatment for various reasons. **Conclusion:** This study provides sufficient evidence to conclude that this population's oral health was poor, with increasing unmet dental treatment needs. Selected interventions and strategies should focus on these factors to decrease the burden of oral diseases among village volunteers.

Keywords: Awareness, dental diseases, dental needs, oral health services, village volunteers

Introduction

Oral health is a crucial element of overall health and well-being that is frequently overlooked.[1] Oral disease, with its associated pain and discomfort, can lead to tooth loss and difficulty in eating and, as a result, affect esthetics, self-esteem, and quality of life. The risk of developing life-threatening complications from oral infections is considerably enhanced due to poor diet, chronic diseases, and the non-availability of oral health services.[1,2]

The Andhra Pradesh government launched the 'village volunteer scheme' to increase welfare programs and services

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Received: 17-06-2023 **Revised:** 10-07-2023
Accepted: 25-08-2023 **Published:** 21-11-2023

Access this article online

Quick Response Code:

Website: http://journals.lww.com/JFMPC

DOI: 10.4103/jfmpc.jfmpc_997_23

How to cite this article: Praveen G, Sravani M, Kadiyala CR, Indukuri SL, Poornima UL, Pampana S. Oral health status, treatment needs, and patterns of utilization of dental services among village volunteers in Andhra Pradesh: A cross-sectional multi-stage cluster survey. J Family Med Prim Care 2023;12:2863-8.

to residents' doorsteps. The scheme assigns one volunteer to every 50 households.[3] These volunteers were entrusted with conducting a door-to-door survey during the coronavirus disease 2019 (COVID-19) crisis to monitor the health situation. The community's health depends on the leadership duties of a diverse group of people, such as health workers, community leaders, religious leaders, school teachers, and village volunteers. The responsibility for their health would embrace coordinating community action for health, including resource mobilization, identifying priorities, and persuading all stakeholders toward improving community health.[4]

Health care utilization is a complicated phenomenon with many facets. To explain this, a range of theories and conceptual models have been proposed. Despite the negative implications of untreated oral diseases, the under-utilization of dental services continues to be a serious issue. With better knowledge of why people utilize or don't use services, programs can be adopted to meet community needs.[5] There is a significant amount of literature on assessing oral health status and treatment needs across various populations in Andhra Pradesh state, such as schoolchildren, rural and older people, factory workers, and so on.[6-10] However, there are no data available on the oral health status of village volunteers, their treatment needs, or their utilization of dental services compared to other populations. Hence, this study was conducted to assess oral health status, treatment needs, and patterns of oral health services among village volunteers in Andhra Pradesh.

Materials and Methods

After ethical approval from the institutional ethics committee (IECVDC/2022/UG01/PHD/Q/72), the study was conducted from November 2022 to April 2023 among village volunteers in Andhra Pradesh state, India. A multi-stage cluster random sampling technique was used for sample selection. In this technique, the study area was divided into clusters based on revenue boundaries. The clusters are then randomly selected using a simple random sampling method. From each selected cluster, a subset of village volunteers was randomly chosen and the process was continued until the desired sample size was achieved. Openepi software version 3.01 was used to calculate the sample size. Given a target population of ~24,000 village volunteers, the prevalence of oral diseases presumed to be 50% with a design effect of 1.5, 95% confidence interval, and 5% margin of error, we estimated that 365 subjects were required for the study. The number of subjects in the final sample was rounded up to 400. All participants were informed about the nature and objective of the study. Subjects who provided informed consent were included, whereas those who refused to participate were excluded from the study. A questionnaire was used to collect information on the patterns of dental service utilization. Along with the demographic details, data on the number of visits to the dentist in the last 12 months, reasons for the visit (e.g., routine check-up, pain/discomfort, referral, etc.), and also the reasons for not visiting the dentist were obtained (the cost of dental services, unavailability, fear of dental treatment, dental problems are not serious, unable to find time, etc.).

A World Health Organization (WHO) Oral Health Assessment form 1997 was used to assess oral health status and treatment needs and was presented under the following headings:

1. Dentition status and treatment need
2. Periodontal disease status
3. Malocclusion status
4. Oral mucosal lesions
5. Dental fluorosis status
6. Others.

During field visits, participants were interviewed. Each interview lasted 5–8 minutes. All subjects were examined by a single and calibrated examiner in natural light, in a standard chair, and under complete aseptic settings. A plane mouth mirror and WHO periodontal probe were used for the clinical evaluation. Each examination took about 15–20 minutes. Duplicate examinations were performed among 25 participants to measure intra-examiner reliability. Cohen Kappa statistics were used to assess intra-examiner reliability, which revealed excellent agreement (K = 0.864). A trained assistant was also taken for recording the data. Data obtained were entered in Microsoft Excel Sheet 2007, and statistical analysis was done using SPSS version 25.0 (SPSS, Inc., Chicago, IL, USA). Frequencies and percentages were determined for qualitative variables, whereas means and standard deviations were calculated for quantitative data.

Results

A total of 400 village volunteers formed a representative sample from the study population. Of them, 56% were males, and 44% were females with a mean age of 23.8 + 4.6 years. Table 1 shows the patterns of utilization of dental services. About 18% of the study participants were never to a dentist in their lifetime, and only 21% visited the dental clinic during the last 6 months. Only about 5.25% visited the dentist as a routine checkup, while 32% of the study participants visited the dentist with pain/discomfort. Interestingly, 60% of the participants had taken home care or visited registered medical practitioners for dental treatment. The seriousness of dental diseases/conditions and the expense of dental treatments were cited as main reasons for not visiting the dental office.

Table 2 depicts the dentition status and treatment needs. Dental caries was seen in 69.5% of the study participants. Only 8% of them had restored teeth, and 22% had missing teeth. One surface filling was required for 48% of the participants, while 47.2% needed extractions. Overall, 94% of the study participants needed dental treatment for various reasons.

The Community Periodontal Index (CPI) was used to assess the periodontal disease status. The majority of them were (49%) presented with calculus (Code 2), followed by bleeding on

probing (Code 1). A Code of 0 (healthy) was observed among 21.5% of the study subjects. There was no loss of attachment (0–3 mm) seen in 87.5% of the participants, and 11.5% had 4–5 mm of loss of attachment. No participant had a loss of attachment of more than 9 mm [Table 3]. Table 4 shows the malocclusion status of the study participants. The mean number of missing incisor canine premolar teeth and diastema was 0.05 + 0.007 and 0.22 + 0.01, respectively. About 19.8% and 24.3% had crowding and spacing in incisal segments, respectively. The majority (97.25%) had a normal anteroposterior molar relation.

Table 1: Patterns of utilization of dental services

Questions	Category	Value
How many times did you visit a dental clinic in your life time?	Never	72 (18%)
	Once	184 (46%)
	More than once	144 (36%)
	Can't say	-
How many times did you visit a dental clinic in last six months?	Not visited	316 (79%)
	Once	76 (19%)
	More than once	8 (2%)
	Can't say	16 (4%)
What is the reason for your last dental visit?	Routine checkup	21 (5.25%)
	Pain/discomfort	128 (32%)
	Referral	17 (4.25%)
	Any other	162 (40.5%)
	Can't say	72 (18%)
What did you do to get relief from pain/ discomfort in mouth?	Home care/self-medication	112 (28%)
	Registered medical practitioners	128 (32%)
	Medical officer	16 (4%)
	Dental officer	121 (30.25%)
	Can't say	23 (5.75%)
What are the difficulties in obtaining dental treatment for you/ your family?	Cost of dental services	72 (18%)
	Unavailability of dental services	40 (10%)
	Fear of dental treatment	64 (16%)
	Dental problems are not serious	134 (33.5%)
	Unable to find time	72 (18%)
	Can't say	18 (4.5%)

Table 2: Dentition status and treatment needs

Code and criteria[a]	Crown status	Root status	Scores[b]	Treatment need
0	24 (6%)	24 (6%)	0	24 (6%)
1	268 (67%)	2 (0.5%)	1	192 (48%)
2	10 (2.5%)	-	2	43 (10.7%)
3	32 (8%)	-	3	58 (14.5%)
4	64 (16%)	-	4	-
5	24 (6%)	-	5	91 (22.7%)
6	8 (2%)	-	6	189 (47.2%)
7	4 (1%)	-	P	88 (22%)
8	286 (71.5%)	384 (96%)	F	113 (28.2%)
9	2 (0.5%)	81 (20.2%)	9	-

[a]Code and criteria: 0: sound; 1: decay; 2: filled with decay; 3: filled with no decay; 4: missing due to caries; 5: missing due to other reasons; 6: fissure sealant; 7: Bridge abutment, special crown; 8: unerupted tooth/ crown, unexposed root; 9: not recorded. [b]Scores: 0: no treatment; 1: one surface filling; 2: two or more surface filling; 3: crown of any reasons; 4: veneer and laminate; 5: pulp care and restoration; 6:extraction; P: preventive, caries arresting care; F: fissure sealant; 9: not recorded

Table 5 depicts the prevalence of oral cancers and other oral mucosal conditions. Among the study participants, 95.75% had no abnormal mucosal conditions, while 1.25%, 0.75%, 2%, and 0.25% had leukoplakia, lichen planus, ulcerations, and candidiasis, respectively. The prevalence of dental fluorosis was 8.75%, with only questionable, very mild, and mild categories [Table 6]. Extra-oral lesions, TMJ signs and symptoms, and enamel opacities were found in a limited percentage of study participants. A prosthetic need was observed for 28.5%, and referral services were needed for 8.5% of the study participants [Table 7].

Discussion

To the author's knowledge, the present study was the first of its kind to assess oral health status, treatment needs, and utilization of oral health services among village volunteers in Andhra Pradesh state. In India, the prevalence of dental diseases is mostly based on the two large-scale surveys conducted in the past: (i) National Oral Health Survey and Fluoride Mapping by Dental Council of India in 2003 and (ii) Report of multi-centric oral health survey by Ministry of Health and Family Welfare in 2005. According to the reports, dental caries affects about 50–84.7% and periodontal disease about 55.4–89.7% of the Indian population.[11,12] Oral diseases have a global prevalence of 45%, according to the global oral health status report.[13] The prevalence rates of dental diseases in the present study were in accordance with the national and global estimates. There has been no improvement in oral health status in the past three decades, and the prevalence of dental diseases remained a silent epidemic in India.

Many factors contribute to dental diseases, but in India, the perceived importance of oral health is a source of concern. According to dental public health professionals' viewpoint, they regard oral health secondary to general health. It is critical to understand how people use health services and influence this behavior to enhance oral health outcomes. However, oral diseases are largely preventable by regular oral hygiene practices and dental visits.[14] The majority of the participants had never visited a dental clinic in their lifetime and believed that dental diseases were not of serious concern, indicating a negative

Table 3: Periodontal disease status

Community periodontal index	Healthy (code 0)	Bleeding (code 1)	Calculus (code 2)	Pocket 4-5 mm (code 3)	Pocket 6 mm or more (code 4)	Excluded (code X)	Not recorded (code 9)
	86 (21.5%)	94 (23.5%)	196 (49%)	15 (3.7%)	9 (2.3%)	-	-
Loss of attachment	Healthy	4-5 mm	6-8 mm	9-11 mm	12 mm or more	Excluded	Not recorded
	351 (87.75%)	46 (11.5%)	3 (0.75%)	-	-	-	-

attitude and oral health behavior. Due to this fact, a significant need for dental treatment was observed among study participants. Similar results were reported in other studies.[15-19] The pooled dental service utilization among Indian adults was found to be 23.96% in a recent meta-analysis of data from 2011 to 2022.[20] Positive general health behaviors and attitudes are associated with better oral health in a dose-response association. These findings should design appropriate and tailored health promotion programs to achieve the targeted population's oral and general behavioral change.[21]

Several obstacles impede the utilization of dental services.[22] Because village volunteers operate in rural regions, oral health inequities were mostly caused by a lack of awareness, negative attitudes toward oral health, a dental workforce shortage, high treatment costs, anxiety and fear of dental care, and so on. The findings were in accordance with a study conducted by Khoisnam DD *et al.*,[23] in which seriousness of dental diseases, expensive dental treatment charges, lack of time, and so on were mentioned as the reasons for under-utilization of dental services. The WHO mentions a shortage of primary oral health care facilities and an uneven distribution of dental manpower as reasons of the under-utilization of dental services.[24] These barriers can be removed by motivating people and making them aware of oral health problems that remove anxiety and fear to develop a positive attitude toward dental treatment. Oral health disparities in rural communities have spurred the creation of various models to address this issue. Oral healthcare integration into primary care and mobile oral healthcare delivery are two important strategies that have been effectively adopted in rural areas.[25]

Even though the study evaluates the oral health state and treatment needs of village volunteers, it has several drawbacks:

1. The study was cross-sectional, making it difficult to draw causal inferences.
2. Because the study population was limited to the West Godavari District, the results could not be generalized.
3. The current findings were compared to similar research conducted in India. However, due to differences in culture, food habits, dental awareness, attitude, and geographic location, the precision of such comparisons is frequently low. Furthermore, due to a lack of published literature focusing especially on village volunteers, the findings had to be compared to those of other studies that focused on different groups.

The following recommendations are made based on the findings of this study: Making mobile dental services available to the

Table 4: Malocclusion status

Parameters	Category	Value
Missing incisor canine premolar teeth in number in mm		0.05±0.007[a]
Crowding in the incisal segments	No crowding	321 (80.2%)[b]
	One segment crowded	66 (16.5%)[b]
	Two segments crowded	13 (3.2%)[b]
Spacing in the incisal segments	No spacing	303 (75.7%)[b]
	One segment spaced	81 (20.2%)[b]
	Two segments spaced	16 (4%)[b]
Diastema in mm		0.22±0.01[a]
Largest anterior maxillary irregularity in mm		0.88±0.04[a]
Largest anterior mandibular irregularity in mm		0.63±0.09[a]
Anterior maxillary over jet in mm		0.86±0.28[a]
Anterior mandibular over jet in mm		0.02±0.001[a]
Vertical anterior open bite in mm		0.04±0.001[a]
Antero posterior molar relation	Normal	389 (97.25%)[b]
	Half cusp	8 (2%)[b]
	Full cusp	3 (0.75%)[b]

[a]Continuous variables are represented in Mean±Standard Deviation. [b]Categorical variables are represented in *n* (%)

Table 5: Oral Cancers and other oral mucosal conditions

Condition	Value
No abnormal condition	383 (95.75%)
Oral cancer	-
Leukoplakia	5 (1.25%)
Lichen planus	3 (0.75%)
Ulcerations	8 (2%)
Acute Necrotizing Ulcerative Gingivitis	-
Candidiasis	1 (0.25%)
Abscess	-

Table 6: Dental Fluorosis status

Condition	Value
No abnormal	365 (91.25%)
Questionable	16 (4%)
Very mild	13 (3.25%)
Mild	6 (1.5%)
Moderate	-
Severe	-
Excluded	-
Not recorded	-

Table 7: Other conditions: Extra-oral Lesions; TMJ Assessment; Enamel Opacities and Hypoplasia; Prosthetic Status and Need; and need for immediate Care and Referrals

Parameters	Category	Value
Extra-oral lesions	Present	7 (1.75%)
	Absent	393 (98.25%)
TMJ signs and symptoms	Present	3 (0.75%)
	Absent	397 (99.25%)
Enamel opacities/ hyperplasia	Present	13 (3.25%)
	Absent	387 (96.75%)
Prosthetic status	Present	4 (1%)
	Absent	396 (99%)
Prosthetic need	Yes	114 (28.5%)
	No	286 (71.5%)
Need for immediate care and referral	Life-threatening condition	-
	Pain or infection	6 (1.5%)
	Other condition	3 (0.75%)
	Referral	34 (8.5%)

unreached can improve access to dental health. Regular health promotion activities should be provided to progress their oral health awareness, knowledge, and behaviors. More research is needed to determine the state of oral health and treatment needs among village volunteers so that the government can support oral health programs.

Conclusions

The present study was conducted among 400 village volunteers in West Godavari, Andhra Pradesh. It demonstrated that oral health status was relatively poor with higher treatment needs. The main reason for the under-utilization of dental services was that dental diseases were not a serious concern. Effective oral disease prevention and control measures targeting the study population are suggested.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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