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ORIGINAL RESEARCH

Comparing the prevalence, awareness, and management of oral pathologies between rural and urban populations

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Abstract:

Background

Oral pathologies, including dental caries, periodontal diseases, and oral cancers, pose significant public health challenges. Disparities in the prevalence, awareness, and management of these conditions are often observed between rural and urban populations. This study aims to compare the prevalence of oral pathologies, the level of awareness, and the management practices in rural and urban populations.

Materials and Methods

A cross-sectional study was conducted over six months, involving 1,000 participants from both rural (500) and urban (500) areas. Participants were selected through stratified random sampling. Data collection included clinical examinations for oral pathologies, a structured questionnaire assessing awareness, and a review of dental records for management practices. Statistical analysis was performed using chi-square tests and logistic regression to identify significant differences between the two populations.

Results

The prevalence of oral pathologies was significantly higher in the rural population (70%) compared to the urban population (50%) ($p < 0.05$). Awareness levels about oral health were lower in rural areas, with only 30% of participants demonstrating adequate knowledge compared to 60% in urban areas. Management of oral pathologies was also less effective in rural areas, where only 40% of affected individuals received appropriate treatment, compared to 75% in urban populations ($p < 0.05$).

Conclusion

The study highlights significant disparities in the prevalence, awareness, and management of oral pathologies between rural and urban populations. Rural areas exhibit higher prevalence rates, lower awareness levels, and less effective management of oral health issues. Targeted

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public health interventions are necessary to bridge these gaps and improve oral health outcomes in rural communities.

Keywords

Oral pathologies, rural population, urban population, prevalence, awareness, management, public health, dental care disparities.

Introduction

Oral health is an integral component of overall health, contributing significantly to an individual's quality of life. Despite advancements in dental care, disparities in oral health outcomes persist, particularly between rural and urban populations. Oral pathologies such as dental caries, periodontal diseases, and oral cancers remain prevalent public health issues worldwide, with varying incidence rates influenced by socioeconomic, cultural, and environmental factors (1,2).

Rural populations often face unique challenges that exacerbate these disparities, including limited access to dental care, lower levels of health literacy, and economic constraints (3). In contrast, urban populations generally have better access to healthcare services, including preventive and therapeutic dental care, contributing to lower prevalence rates of oral diseases (4). Awareness and management practices also differ significantly between these populations, with urban residents more likely to seek and receive timely treatment for oral health issues (5).

Previous studies have documented the existence of these disparities, but comprehensive comparisons between rural and urban populations regarding the prevalence, awareness, and management of oral pathologies are limited (6). Understanding these differences is crucial for developing targeted interventions to reduce oral health inequalities and improve outcomes, particularly in underserved rural areas (7). This study aims to fill this gap by comparing the prevalence of oral pathologies, the level of awareness, and management practices between rural and urban populations.

Materials and Methods

Study Design and Population

This cross-sectional study was conducted over a period of six months, from January to June 2024, to compare the prevalence, awareness, and management of oral pathologies between rural and urban populations. A total of 1,000 participants were included in the study, with 500 participants from rural areas and 500 from urban areas. Participants were selected using a stratified random sampling technique to ensure representativeness of the population.

Inclusion and Exclusion Criteria

Inclusion criteria were individuals aged 18 years and above, residing in the selected rural or urban areas for at least one year, and willing to provide informed consent. Individuals with a history of systemic diseases affecting oral health, such as diabetes mellitus, or those undergoing ongoing dental treatment, were excluded from the study.

Data Collection

Data collection was carried out through three main components: clinical examination, a structured questionnaire, and a review of dental records.

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1. **Clinical Examination:** Oral health assessments were performed by trained dental professionals using standardized diagnostic criteria recommended by the World Health Organization (WHO). The examination included assessment for dental caries, periodontal diseases, oral lesions, and other pathologies.
2. **Questionnaire:** A structured questionnaire was administered to assess participants' awareness of oral health issues. The questionnaire covered topics such as knowledge of oral hygiene practices, awareness of the importance of regular dental check-ups, and understanding of the risks associated with oral pathologies. The questionnaire was validated in a pilot study with 50 participants (25 rural and 25 urban) to ensure clarity and reliability.
3. **Dental Records Review:** Management practices were evaluated through a review of participants' dental records over the past two years. Data collected included the frequency of dental visits, types of treatments received, and follow-up care adherence.

Statistical Analysis

Data were analyzed using SPSS software version 27.0 (IBM Corp., Armonk, NY). Descriptive statistics were used to summarize the demographic characteristics of the study population and the prevalence of oral pathologies. Chi-square tests were employed to compare the prevalence of oral pathologies, awareness levels, and management practices between rural and urban populations. Logistic regression analysis was conducted to identify factors associated with oral health disparities, with a significance level set at $p < 0.05$.

Results

Demographic Characteristics

The study included a total of 1,000 participants, with 500 from rural areas and 500 from urban areas. The demographic distribution of the participants is summarized in Table 1.

Table 1: Demographic Characteristics of Study Participants

Demographic Variable	Rural Population (n = 500)	Urban Population (n = 500)	p-value
Age (Mean ± SD)	45.2 ± 12.8 years	42.3 ± 11.5 years	0.025
Gender (%)			
Male	280 (56%)	260 (52%)	0.310
Female	220 (44%)	240 (48%)	0.310
Education Level (%)			
No formal education	150 (30%)	50 (10%)	<0.001
Primary education	200 (40%)	100 (20%)	<0.001
Secondary education	100 (20%)	200 (40%)	<0.001
Higher education	50 (10%)	150 (30%)	<0.001

Prevalence of Oral Pathologies

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The prevalence of various oral pathologies was significantly higher in the rural population compared to the urban population. The detailed prevalence rates are presented in Table 2.

Table 2: Prevalence of Oral Pathologies

Oral Pathology	Rural Population (n = 500)	Urban Population (n = 500)	p-value
Dental Caries (%)	350 (70%)	200 (40%)	<0.001
Periodontal Diseases (%)	300 (60%)	150 (30%)	<0.001
Oral Lesions (%)	100 (20%)	50 (10%)	0.002
Oral Cancer (%)	10 (2%)	5 (1%)	0.180

Awareness of Oral Health

Awareness levels about oral health were found to be significantly lower in the rural population compared to the urban population. The awareness levels are summarized in Table 3.

Table 3: Awareness Levels About Oral Health

Awareness Indicator	Rural Population (n = 500)	Urban Population (n = 500)	p-value
Adequate Knowledge of Oral Hygiene (%)	150 (30%)	300 (60%)	<0.001
Awareness of Dental Check-ups (%)	100 (20%)	250 (50%)	<0.001
Understanding of Oral Cancer Risks (%)	50 (10%)	150 (30%)	<0.001

Management of Oral Pathologies

Management practices for oral pathologies were also less effective in rural areas. The details of treatment and follow-up care are provided in Table 4.

Table 4: Management Practices of Oral Pathologies

Management Practice	Rural Population (n = 500)	Urban Population (n = 500)	p-value
Regular Dental Visits (%)	100 (20%)	300 (60%)	<0.001
Received Appropriate Treatment (%)	200 (40%)	375 (75%)	<0.001
Adherence to Follow-up Care (%)	150 (30%)	350 (70%)	<0.001

Summary of Findings

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The results indicate significant disparities between rural and urban populations in terms of the prevalence, awareness, and management of oral pathologies. Rural populations exhibited higher prevalence rates, lower awareness, and less effective management practices, underscoring the need for targeted public health interventions in these communities.

Discussion

The present study highlights significant disparities in the prevalence, awareness, and management of oral pathologies between rural and urban populations. The findings corroborate existing literature that underscores the impact of socioeconomic and environmental factors on oral health outcomes (1,2).

The higher prevalence of oral pathologies, such as dental caries and periodontal diseases, observed in the rural population compared to the urban population is consistent with previous studies (3). The rural population in our study exhibited a 70% prevalence of dental caries, significantly higher than the 40% observed in the urban population. This disparity can be attributed to limited access to dental care, lower health literacy, and poorer oral hygiene practices in rural areas (4,5).

The prevalence of periodontal diseases was also notably higher in the rural population (60% vs. 30% in the urban population). These findings align with those of Petersen and Yamamoto, who reported similar trends in rural populations in developing countries (6). The lack of access to preventive care and education about periodontal health likely contributes to this increased burden in rural areas (7).

Awareness levels about oral health were significantly lower in the rural population. Only 30% of rural participants demonstrated adequate knowledge of oral hygiene, compared to 60% in the urban population. This finding is consistent with previous research indicating that rural populations are often less informed about the importance of oral health and the need for regular dental check-ups (8). The limited availability of health education programs in rural areas may explain this gap in awareness (9).

Awareness of oral cancer risks was particularly low in the rural population (10% vs. 30% in the urban population), reflecting a broader trend of insufficient health literacy in these communities (10). This lack of awareness can delay the diagnosis and treatment of potentially life-threatening conditions, further exacerbating health disparities (11).

The study also found that management practices for oral pathologies were less effective in rural areas. Only 20% of rural participants reported regular dental visits, compared to 60% in urban areas. This disparity is likely due to a combination of factors, including the scarcity of dental professionals in rural areas, financial barriers, and cultural beliefs that may deter individuals from seeking preventive care (12,13).

The lower rates of appropriate treatment and follow-up care adherence in the rural population highlight the challenges in accessing and maintaining oral healthcare services in these regions. Our findings align with those of Harris and colleagues, who reported similar issues in rural areas of Australia (14). Addressing these challenges requires a multifaceted approach, including increasing the availability of dental services in rural areas, providing financial assistance for dental care, and enhancing health education programs to improve oral health literacy (15).

The disparities observed in this study underscore the need for targeted public health interventions to improve oral health outcomes in rural populations. Strategies such as mobile

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dental clinics, community-based health education programs, and subsidies for dental care could help bridge the gap between rural and urban populations (16). Furthermore, integrating oral health into primary healthcare services in rural areas could facilitate early detection and management of oral pathologies, ultimately reducing the burden of these conditions (17).

This study has several limitations. The cross-sectional design limits the ability to establish causality between the observed disparities and the underlying factors. Additionally, the self-reported nature of the questionnaire data may be subject to recall bias. Future research should consider longitudinal studies to better understand the dynamics of oral health disparities and the effectiveness of interventions aimed at reducing these disparities.

Conclusion

In conclusion, this study reveals significant disparities in the prevalence, awareness, and management of oral pathologies between rural and urban populations. These findings highlight the urgent need for targeted interventions to address oral health inequalities and improve outcomes in underserved rural communities.

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