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ORIGINAL RESEARCH

The association between denture care and oral hygiene habits, oral hygiene knowledge and periodontal status of geriatric patients wearing removable partial dentures

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ABSTRACT

Background: Denture care is a crucial aspect of oral hygiene, particularly in geriatric patients who wear removable partial dentures. Poor denture hygiene can lead to various oral health issues, including periodontal disease. This study aims to evaluate the association between denture care habits, oral hygiene knowledge, and the periodontal status of geriatric patients in Bhagalpur District, Bihar.

Materials and Methods: A total of 75 geriatric patients wearing removable partial dentures were included in this study. The study was conducted over a period of 6 to 9 months. Participants were assessed for their denture care habits, oral hygiene knowledge, and periodontal status using a structured questionnaire and clinical periodontal examination. The periodontal examination included measures of plaque index, gingival index, and pocket depth. Data were analyzed using descriptive statistics and correlation analysis.

Results: The average age of the participants was 68 years. Approximately 60% of the patients demonstrated inadequate denture care habits. Oral hygiene knowledge was found to be moderate in 45% of the participants, while 35% had poor knowledge and 20% had good knowledge. Periodontal status was significantly associated with denture care habits and oral hygiene knowledge. Patients with good denture care habits had a lower plaque index (mean = 1.2) and gingival index (mean = 1.0) compared to those with inadequate denture care habits (plaque index mean = 2.5; gingival index mean = 2.3). A positive correlation ($r = 0.65$, $p < 0.01$) was observed between oral hygiene knowledge and periodontal health status.

Conclusion: The study highlights the importance of adequate denture care and oral hygiene knowledge in maintaining periodontal health among geriatric patients with removable partial dentures. Improved education on denture care and regular dental check-ups are recommended to enhance oral health outcomes in this population.

Keywords: Denture care, oral hygiene habits, geriatric patients, removable partial dentures, periodontal status, oral hygiene knowledge.

INTRODUCTION

The geriatric population is increasing globally, leading to a higher prevalence of edentulism and the subsequent need for removable partial dentures (RPDs) to restore masticatory function and aesthetics (1). Proper denture care is essential to prevent oral health issues such as denture stomatitis, oral candidiasis, and periodontal diseases, which are common among denture wearers (2). However, maintaining optimal oral hygiene can be challenging for older adults due to factors such as decreased manual dexterity, cognitive impairment, and limited access to dental care (3).

Studies have shown that poor denture hygiene is linked to increased plaque accumulation, gingival inflammation, and periodontal pocket formation (4). Additionally, there is evidence suggesting that oral hygiene knowledge significantly influences denture care practices and overall oral health status (5). Despite the importance of these factors, there is limited research specifically focusing on the association between denture care habits, oral hygiene knowledge, and periodontal status among geriatric patients wearing RPDs in India.

Bhagalpur District, Bihar, is a region with a significant geriatric population, many of whom rely

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on RPDs for their oral rehabilitation. Understanding the relationship between their denture care habits, oral hygiene knowledge, and periodontal health can provide valuable insights for improving dental care strategies for this vulnerable group.

This study aims to evaluate the association between denture care habits, oral hygiene knowledge, and the periodontal status of geriatric patients wearing RPDs in Bhagalpur District, Bihar. By identifying the key factors that influence oral health in this population, targeted interventions can be developed to enhance their oral hygiene practices and periodontal health outcomes.

MATERIALS AND METHODS

Study Design and Setting: This cross-sectional study was conducted over a period of 6 to 9 months on dental patients in Bhagalpur District, Bihar. The aim was to assess the association between denture care habits, oral hygiene knowledge, and periodontal status in geriatric patients wearing removable partial dentures (RPDs).

Sample Size and Participants: A total of 75 geriatric patients (aged 60 years and above) who were wearing RPDs for at least six months were included in the study. Participants were selected using convenience sampling from the dental patients in Bhagalpur District. Informed consent was obtained from all participants before their inclusion in the study.

Inclusion and Exclusion Criteria: Inclusion criteria:

- Age 60 years and above.
- Wearing RPDs for at least six months.
- Willing to participate and provide informed consent.

Exclusion criteria:

- Presence of any systemic condition affecting periodontal health.
- Use of antibiotics or antiseptic mouthwash within the past three months.
- History of periodontal therapy within the past six months.

Data Collection: Data were collected through a combination of structured questionnaires and clinical periodontal examinations.

Questionnaire: A structured questionnaire was administered to collect data on the participants' demographic information, denture care habits, and oral hygiene knowledge. The questionnaire included sections on:

- Frequency and method of denture cleaning.
- Use of denture cleaning aids (e.g., brushes, cleaning solutions).
- Awareness and understanding of oral hygiene practices.

Clinical Periodontal Examination: The clinical periodontal examination was performed by a trained periodontist. The examination included the following indices:

- **Plaque Index (PI):** Assessed the thickness of plaque at the gingival area of the teeth.
- **Gingival Index (GI):** Measured the severity of gingivitis based on color, consistency, and bleeding on probing.
- **Pocket Depth (PD):** Measured the depth of the periodontal pockets using a periodontal probe.

Statistical Analysis: Descriptive statistics were used to summarize the demographic data, denture care habits, and oral hygiene knowledge. The association between denture care habits, oral hygiene knowledge, and periodontal status was analyzed using Pearson's correlation coefficient. Independent t-tests were used to compare the periodontal indices between groups with different levels of denture care habits and oral hygiene knowledge. A p-value of less than 0.05 was considered statistically significant.

All statistical analyses were performed using SPSS software (version 25.0, IBM Corp., Armonk, NY).

Results

Demographic Characteristics: The study included 75 geriatric patients wearing removable partial dentures (RPDs). The demographic characteristics of the participants are summarized in Table 1.

Characteristic	Value
Mean Age (years)	68 ± 5
Gender	
- Male	42 (56%)
- Female	33 (44%)
Duration of Denture Use	
- 6-12 months	28 (37%)
- >12 months	47 (63%)

Denture Care Habits: The denture care habits of the participants are summarized in Table 2.

Denture Care Habit	Frequency
Cleaning Frequency	

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- Once daily	45 (60%)
- Twice daily	20 (27%)
- Occasionally	10 (13%)
Cleaning Method	
- Brushing	50 (67%)
- Soaking in cleaning solution	15 (20%)
- Both brushing and soaking	10 (13%)
Use of Cleaning Aids	
- Denture brush	40 (53%)
- Regular toothbrush	25 (33%)
- No specific cleaning aid	10 (13%)

Oral Hygiene Knowledge: The level of oral hygiene knowledge among participants is shown in Table 3.

Knowledge Level	Frequency
Poor	26 (35%)
Moderate	34 (45%)
Good	15 (20%)

Periodontal Status: The periodontal status of the participants was assessed using the Plaque Index (PI), Gingival Index (GI), and Pocket Depth (PD). The results are presented in Table 4.

Periodontal Index	Mean ± SD
Plaque Index	1.8 ± 0.6
Gingival Index	1.6 ± 0.5
Pocket Depth (mm)	3.2 ± 0.8

Association Between Variables: A significant association was found between denture care habits and periodontal indices. Patients with good denture care habits had significantly lower PI, GI, and PD values compared to those with inadequate denture care habits ($p < 0.05$). Similarly, higher oral hygiene knowledge was positively correlated with better periodontal status ($r = 0.65$, $p < 0.01$). The results are detailed in Table 5.

Group	Plaque Index	Gingival Index	Pocket Depth (mm)
Good Denture Care	1.2 ± 0.4	1.0 ± 0.3	2.8 ± 0.5
Inadequate Denture Care	2.5 ± 0.5	2.3 ± 0.6	3.8 ± 0.7
Good Knowledge	1.1 ± 0.3	0.9 ± 0.2	2.7 ± 0.4
Poor Knowledge	2.4 ± 0.6	2.2 ± 0.5	3.7 ± 0.8

The results indicate that geriatric patients with better denture care habits and higher oral hygiene knowledge have significantly better periodontal health. These findings suggest the need for targeted education and interventions to improve denture care and oral hygiene practices among elderly denture wearers.

DISCUSSION

This study investigated the association between denture care habits, oral hygiene knowledge, and periodontal status among geriatric patients wearing removable partial dentures (RPDs) in Bhagalpur District, Bihar. The findings revealed significant correlations between these variables, emphasizing the importance of proper denture hygiene and oral health education in maintaining periodontal health in elderly individuals.

The demographic characteristics of the study population showed a higher proportion of male participants (56%), which is consistent with previous studies indicating gender differences in dental care utilization and denture wearing patterns among the elderly (1). The mean age of the participants was 68 years, reflecting the typical age range of RPD users in geriatric populations (2).

Our results indicated that the majority of participants (60%) cleaned their dentures once daily, with brushing being the most common cleaning method (67%). However, a notable proportion of participants (13%) reported cleaning their dentures only occasionally. These findings align with existing literature suggesting that many elderly individuals do not adhere to recommended denture cleaning practices, which can adversely affect oral health (3, 4).

The assessment of oral hygiene knowledge revealed that 35% of the participants had poor knowledge, while 45% had moderate knowledge, and only 20% had good knowledge. This distribution underscores the need for enhanced educational efforts targeting geriatric patients to improve their understanding of

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effective oral hygiene practices. Previous studies have also highlighted the gap in oral health knowledge among older adults and its impact on oral hygiene behaviors (5, 6).

The periodontal status of the participants, as measured by the Plaque Index (PI), Gingival Index (GI), and Pocket Depth (PD), showed significant associations with both denture care habits and oral hygiene knowledge. Participants with good denture care habits exhibited lower PI and GI scores, indicating better periodontal health compared to those with inadequate habits. Similarly, higher oral hygiene knowledge was positively correlated with better periodontal status. These findings are consistent with studies that have demonstrated the relationship between effective denture hygiene, oral health knowledge, and reduced risk of periodontal disease (7, 8).

The study's results support the hypothesis that improving denture care habits and oral hygiene knowledge can lead to better periodontal outcomes in geriatric patients. Targeted interventions, such as educational programs and regular dental check-ups, are essential to promote optimal denture hygiene practices and enhance oral health literacy among elderly denture wearers. Moreover, dental professionals should emphasize the importance of comprehensive oral hygiene routines, including the use of appropriate cleaning aids and methods, to prevent plaque accumulation and periodontal issues (9,10).

Despite the valuable insights gained, this study has certain limitations. The cross-sectional design limits the ability to establish causality between denture care habits, oral hygiene knowledge, and periodontal status. Additionally, the convenience sampling method may not fully represent the broader geriatric population in Bhagalpur District, Bihar. Future studies with longitudinal designs and larger, randomized samples are needed to further validate these findings and explore the long-term effects of improved denture care and oral hygiene education on periodontal health.

CONCLUSION

In conclusion, the study highlights the critical role of denture care habits and oral hygiene knowledge in maintaining periodontal health among geriatric patients wearing RPDs. Enhancing oral health education and promoting regular dental visits can significantly contribute to better oral hygiene practices and periodontal outcomes in this vulnerable population.

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