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Impact of Prosthodontic Rehabilitation on Nutritional Status in Elderly Individuals

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ABSTRACT

Background Tooth loss and compromised dentition are common among elderly individuals and may adversely affect chewing efficiency, food selection, and nutritional status. Prosthodontic rehabilitation has been suggested to improve oral function and dietary intake; however, evidence regarding its impact on nutritional status remains limited. The study was conducted to evaluate the impact of prosthodontic rehabilitation on the nutritional status of elderly individuals.

Materials and Methods A hospital-based prospective interventional study was conducted among 220 elderly individuals requiring prosthodontic rehabilitation. Participants aged 60 years or older who met the eligibility criteria were included. Baseline demographic and clinical data were recorded. Nutritional status was assessed before and after rehabilitation using body mass index (BMI), Mini Nutritional Assessment (MNA) score, chewing ability score, and dietary intake patterns. Participants underwent indicated prosthodontic treatment, including complete dentures, removable partial dentures, or fixed prostheses. A follow-up assessment was performed after the adaptation period. Data were analysed using SPSS software. Descriptive statistics and paired comparison tests were applied, and $p<0.05$ was considered statistically significant.

Results Among 220 participants, most belonged to the 60–69 years age group, and partial edentulism was more common. Significant improvement was observed following prosthodontic rehabilitation. Mean BMI increased from 20.82±2.74 to 22.04±2.68, while mean MNA score improved from 19.46±3.12 to 23.88±2.94 ($p<0.001$). Chewing ability also showed significant improvement. Dependence on soft diets reduced, and intake of fruits, vegetables, and protein-rich foods increased significantly after treatment.

ConclusionProsthodontic rehabilitation positively influenced nutritional status, chewing ability, and dietary behavior among elderly individuals. Restoration of oral function may contribute to healthier aging and should form an integral component of geriatric oral healthcare.

Introduction

Aging is commonly associated with several oral and systemic changes that can negatively influence nutrition and overall quality of life. Among these changes, tooth loss remains one of the most common oral health problems affecting

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older adults. Loss of teeth reduces masticatory efficiency, alters food choices, and may lead to poor dietary intake and nutritional imbalance.[1] Many elderly individuals tend to avoid hard, fibrous foods such as fruits, vegetables, and protein-rich foods because of chewing difficulty, thereby increasing the risk of nutritional deficiencies.[2]

Edentulism and compromised dentition have been considered significant public health concerns among older adults. Besides affecting chewing ability, missing teeth may impair speech, facial appearance, and social interaction, resulting in reduced self-confidence and diminished quality of life.[3] Poor oral health and malnutrition often coexist in older populations and may create a cycle in which impaired nutrition further worsens systemic and oral health conditions.[4]

Prosthodontic rehabilitation plays an important role in restoring oral function in elderly individuals. Treatment options such as complete dentures, removable partial dentures, and fixed prostheses are designed to restore mastication, improve esthetics, and enhance functional efficiency.[5] Successful prosthodontic rehabilitation may enable older adults to return to a more balanced diet by improving their ability to chew and process food.[6]

Several studies have evaluated the association between prosthetic treatment and dietary intake among older adults. Evidence suggests that restoration of dentition can positively influence food selection, nutritional behaviour, and body composition, although the magnitude of improvement varies according to prosthesis type, adaptation, and patient-related factors.[7] Nutritional assessment in elderly individuals, therefore, becomes an important component while evaluating the effectiveness of prosthodontic treatment.

Despite growing awareness of geriatric oral healthcare, few studies have comprehensively assessed the direct impact of prosthodontic rehabilitation on nutritional status in elderly populations, particularly in developing countries. [8] Understanding this relationship may help clinicians plan more holistic rehabilitation strategies that address both oral function and nutritional well-being. Therefore, the present study was undertaken to evaluate the impact of prosthodontic rehabilitation on the nutritional status of elderly individuals.

Methodology

Study Design and Setting

A hospital-based prospective interventional study was conducted in the Department of Prosthodontics of a tertiary care dental institution to evaluate the impact of prosthodontic rehabilitation on the nutritional status of elderly individuals. The study population consisted of elderly individuals requiring prosthodontic rehabilitation. Ethical approval was obtained from the Institutional Ethics Committee prior to commencement of the study. Written informed consent was obtained from all participants after explaining the study objectives and procedures.

Sample Size

A total of 220 elderly participants who fulfilled the eligibility criteria and consented to participate were included in the study.

Inclusion Criteria

- Elderly individuals aged 60 years and above
- Partially or completely edentulous patients requiring prosthodontic rehabilitation
- Patients willing to undergo treatment and participate in follow-up assessment
- Patients are able to provide informed consent

Exclusion Criteria

- Individuals with severe systemic illness affecting nutrition or mastication
- Patients with neuromuscular disorders or cognitive impairment interfering with assessment
- Individuals receiving nutritional supplementation or dietary therapy for major medical conditions
- Patients unwilling to participate or unable to attend follow-up visits

Data Collection Procedure

Baseline demographic and clinical details, including age, gender, medical history, dental status, and type of edentulism, were recorded using a structured proforma. Oral examination was performed under standard clinical conditions. Baseline nutritional status was assessed prior to prosthodontic treatment using anthropometric and nutritional assessment methods. Parameters such as body mass index (BMI), dietary intake pattern, and Mini Nutritional Assessment (MNA) score were recorded. Information regarding meal frequency, food consistency preference, and chewing difficulty was also documented.

Participants subsequently underwent prosthodontic rehabilitation as indicated by clinical requirements. Treatment included complete dentures, removable partial dentures, or other indicated prosthetic rehabilitation. Standard clinical and laboratory procedures were followed for the fabrication and delivery of prostheses. After prosthesis insertion, participants were provided with oral hygiene and denture maintenance instructions. Follow-up evaluations

were conducted after a one-month adaptation period.
The primary outcome measure was the change in nutritional status following prosthodontic rehabilitation. Secondary outcomes included improvement in chewing ability, dietary pattern, and patient-reported comfort during mastication.

Statistical Analysis

The collected data were entered into Microsoft Excel and analyzed using Statistical Package for Social Sciences (SPSS) software version 26.0. Descriptive statistics were expressed as frequency, percentage, mean, and standard deviation. Pre- and post-rehabilitation nutritional parameters were compared using appropriate statistical tests, such as the paired t-test or the Wilcoxon signed-rank test, depending on the data distribution. A p-value of less than 0.05 was considered statistically significant.

Results

A total of 220 elderly individuals who underwent prosthodontic rehabilitation were included in the study. The results demonstrated improvement in nutritional and functional parameters following prosthodontic treatment. Changes were observed in body mass index, Mini Nutritional Assessment (MNA) scores, chewing ability, and food intake patterns after rehabilitation.

Table 1: Baseline Demographic and Prosthodontic Profile of Study Participants

Variable	Frequency (n)	Percentage (%)
Age Group (years)		
60–69	112	50.9
70–79	78	35.5
≥80	30	13.6
Gender		
Male	124	56.4
Female	96	43.6
Type of Edentulism		
Partially edentulous	132	60.0
Completely edentulous	88	40.0
Type of Prosthodontic Rehabilitation		
Complete denture	82	37.3
Removable partial denture	74	33.6
Fixed prosthesis	64	29.1

Most participants were in the 60–69-year age group (50.9%). Males were slightly more common than females. Partial edentulism was more prevalent (60.0%). Complete dentures are the most common prosthodontic treatment.

Table 2: Comparison of Nutritional Status Before and After Prosthodontic Rehabilitation

Variable	Pre-rehabilitation Mean ± SD	Post-rehabilitation Mean ± SD	p-value
Body Mass Index (kg/m²)	20.82 ± 2.74	22.04 ± 2.68	<0.001*
Mini Nutritional Assessment (MNA) Score	19.46 ± 3.12	23.88 ± 2.94	<0.001*
Chewing Ability Score (0–10)	4.28 ± 1.63	7.82 ± 1.42	<0.001*

*=Significant

A statistically significant improvement was observed in BMI, MNA score, and chewing ability following prosthodontic rehabilitation ($p<0.001$), indicating improved nutritional and functional status.

Table 3: Change in Dietary Pattern and Food Intake Following Prosthodontic Rehabilitation

Variable	Pre-rehabilitation n (%)	Post-rehabilitation n (%)	Chi-square	p-value
Preference for Soft Diet	156 (70.9)	68 (30.9)	42.83	<0.001*
Regular Fruit and Vegetable Intake	74 (33.6)	162 (73.6)	38.16	<0.001*
Difficulty in Chewing	184 (83.6)	52 (23.6)	64.75	<0.001*
Consumption of Protein-rich Foods	82 (37.3)	148 (67.3)	21.47	<0.001*

Dietary habits improved significantly after prosthodontic rehabilitation. Preference for soft foods and chewing difficulty decreased, while intake of fruits, vegetables, and protein-rich foods increased significantly ($p<0.001$).

Discussion

The present study evaluated the impact of prosthodontic rehabilitation on the nutritional status of elderly individuals and demonstrated significant improvement in nutritional and functional outcomes following treatment. Significant increases in BMI, Mini Nutritional Assessment (MNA) scores, and chewing ability were observed after prosthodontic

rehabilitation. In addition, participants showed healthier dietary patterns, including reduced dependence on soft foods and increased intake of fruits, vegetables, and protein-rich foods. These findings suggest that prosthodontic rehabilitation contributes positively to both oral function and nutritional well-being in elderly individuals.

In the present study, the majority of participants were in the 60–69-year age group, and partial edentulism was more common than complete edentulism. This pattern reflects the progressive nature of tooth loss in older adults and agrees with previous literature indicating that partial tooth loss remains a common oral health problem among the elderly population.[9] Tooth loss and compromised dentition are known to reduce chewing efficiency and affect dietary choices, often leading to inadequate nutrition and deterioration in general health.[10]

Significant improvements in BMI and MNA scores were noted following rehabilitation. These findings indicate that restoration of oral function may positively influence nutritional status. Elderly individuals with impaired dentition frequently avoid foods that are difficult to chew, such as fresh fruits, vegetables, and meat, and instead depend on softer, carbohydrate-rich foods with lower nutritional value.[11] Similar findings were reported by Iwasaki et al., who observed that better dentition status and oral rehabilitation were associated with improved nutritional indicators among older adults.[11] Kossioni also highlighted that oral rehabilitation may decrease nutritional risk and support healthier aging.[12]

The chewing ability score improved considerably after prosthodontic rehabilitation in the present study. Efficient mastication is essential for food breakdown and comfortable eating. Edentulous individuals often experience discomfort, reduced bite force, and limited food choices.[13] Restoration of occlusal support through prosthetic treatment helps improve chewing performance and eating comfort. Comparable findings were reported by Ikebe et al., who demonstrated an association between oral function and nutritional status among elderly populations.[13]

The present study also demonstrated significant dietary changes after rehabilitation. Preference for soft diets decreased markedly, while consumption of fruits, vegetables, and protein-rich foods increased significantly. These findings are consistent with those of Bradbury et al., who reported that denture rehabilitation was associated with improved dietary quality and increased intake of healthy foods.[15] Zhu and Hollis similarly observed that elderly individuals with functional prosthetic replacement were more likely to maintain balanced diets and better nutritional status.[16]

However, nutrition among elderly individuals is influenced by multiple factors, including systemic health, economic status, prosthesis adaptation, and dietary counselling.[12,16] Therefore, prosthodontic rehabilitation should be combined with nutritional guidance and regular follow-up care. Overall, the findings of the present study support the important role of prosthodontic rehabilitation in improving nutritional health and dietary behaviour among elderly individuals.

Conclusion

The present study demonstrated that prosthodontic rehabilitation positively affected the nutritional status and dietary behaviour of elderly individuals. Significant improvement was observed in body mass index, Mini Nutritional Assessment scores, and chewing ability following prosthetic treatment. Rehabilitation also reduced dependence on soft diets and encouraged increased intake of fruits, vegetables, and protein-rich foods. These findings suggest that restoration of oral function through prosthodontic treatment contributes not only to improved mastication and comfort but also to better nutritional well-being. Therefore, prosthodontic rehabilitation should be considered an important component of comprehensive geriatric healthcare and may be further strengthened through nutritional counselling and regular follow-up care.

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