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A Retrospective Study on Complete Denture Replacements among Adults under ECHS Dental Coverage

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ABSTRACT

Statement of Problem: Although complete dentures remain a cornerstone of prosthodontic rehabilitation for edentulous patients, there is limited data regarding their replacement frequency and longevity under public dental coverage schemes such as the Ex-Servicemen Contributory Health Scheme (ECHS) in India.

Purpose: To analyze the frequency and trend of complete denture replacements among adults treated under the ECHS program from 2021 to 2025 and compare it with overall institutional denture replacement trends.

Material and Methods: A retrospective, record-based observational study was conducted at the School of Dental Sciences, Krishna Vishwa Vidyapeeth, Karad. Dental records from 2021–2025 were examined, including ECHS and non-ECHS patients receiving complete dentures, removable partial dentures (RPDs), and total acrylic prostheses. Data were analysed using descriptive statistics, percentage growth calculations, and year-over-year comparison.

Results: A total of 7,337 denture prostheses were fabricated over five years, including 608 complete dentures under ECHS coverage. Complete denture replacements among ECHS beneficiaries increased from **27 in 2021 to 79 in 2025**, representing a **192.6% growth**. In contrast, the total institutional complete dentures increased by **122.5%** over the same period. The rise in ECHS complete denture replacements was more pronounced than the general trend, indicating improved access and awareness among the retired service population.

Conclusions: The study demonstrated a significant increase in denture replacements under ECHS coverage, suggesting greater utilization of prosthodontic services by ex-servicemen. Longitudinal monitoring and policy reinforcement could further enhance prosthetic care delivery in this population.

Clinical Implications: Understanding denture replacement trends under government schemes can guide public health planning, budget allocation, and improve long-term patient satisfaction and prosthesis longevity.

Keywords: Complete denture replacement, Ex-Servicemen Contributory Health Scheme (ECHS), Removable prosthodontics, Denture longevity, Public dental health services.

INTRODUCTION

Complete denture therapy continues to be one of the most frequently performed prosthodontic procedures globally, particularly among the aging population, where edentulism remains a prevalent oral health concern. The rehabilitation of edentulous patients through the fabrication of complete dentures not only restores masticatory efficiency and phonetics but also significantly enhances facial esthetics, psychosocial well-being, and overall quality of life. With the steady increase in life expectancy and the global trend toward an aging demographic, the demand for complete denture therapy is projected to remain substantial despite advancements in implant-based prosthodontics.

In India, a significant proportion of the elderly population relies on government-supported healthcare systems for access to dental care. The **Ex-Servicemen Contributory Health Scheme (ECHS)**, launched by the **Government of India in 2003**, is a comprehensive health benefit program aimed at providing high-quality medical and dental services to retired armed forces personnel and their dependents. Under this scheme, beneficiaries are entitled to a range of dental treatments, including prosthodontic rehabilitation with complete and removable partial dentures, at empanelled government and private centres. The ECHS initiative has been instrumental in reducing the financial burden of oral

rehabilitation among ex-servicemen and promoting equitable access to prosthodontic care across different regions of the country. Despite the widespread implementation of ECHS and the increasing number of beneficiaries availing dental services, there remains a notable paucity of published data addressing the **utilization patterns, frequency, and replacement rates of complete dentures** within this population. While complete denture fabrication is routinely performed, the longevity of the prosthesis and the factors influencing its replacement under the ECHS framework have not been systematically studied. Understanding these trends is essential for resource optimization, clinical policy formulation, and ensuring long-term satisfaction among beneficiaries.

Previous research from other national health programs has provided valuable insight into denture longevity and replacement intervals. Studies conducted within publicly funded dental systems in **Australia** and **Canada** have reported a **mean denture longevity of approximately 6 years**, with replacement rates influenced by socioeconomic status, geographic access, and clinical provider type [9–11]. Literature also indicates that the functional lifespan of a complete denture generally ranges between **5 and 10 years**, depending on multiple factors such as material wear, occlusal deterioration, alveolar ridge resorption, and patient-reported satisfaction levels [1–4]. However, these studies are geographically and demographically distinct from the Indian context, where healthcare delivery, patient behaviour, and prosthodontic service models differ significantly.

To date, there is an evident **knowledge gap** regarding the prosthodontic service utilization and denture replacement behaviour among ex-servicemen covered under the ECHS. No comprehensive Indian study has evaluated temporal trends or quantified the rate of complete denture replacements within this unique beneficiary group.

Therefore, the present study was designed to address this gap by conducting a **retrospective analysis of institutional records spanning five years (2021–2025)** to evaluate the **frequency, growth trends, and utilization patterns** of complete denture replacements under ECHS dental coverage. The study also aims to compare these data with overall institutional prosthodontic service statistics, thereby providing an evidence-based overview of denture replacement dynamics in an Indian publicly funded healthcare framework.

MATERIALS AND METHODS

Study Design
A retrospective, record-based observational study was conducted from 2021–2025 using institutional treatment records.

Study Setting
The data were retrieved from the Department of Prosthodontics, School of Dental Sciences, Krishna Vishwa Vidyapeeth, Karad—an empanelled ECHS dental centre providing prosthodontic care to ex-servicemen and general patients.

Population and Sample
All patients aged **45 years and above** who received at least one **complete denture or removable partial denture (RPD)** during the study period were included. Exclusion criteria included incomplete or missing records and patients receiving only partial prostheses.

Data Collection
The total number of **ECHS** and **non-ECHS** prosthodontic procedures were extracted from departmental logs. Data included complete dentures, removable partial dentures, and total acrylic prostheses fabricated annually from 2021–2025.

Year	ECHS Complete Dentures	ECHS RPDs	Total Complete Dentures	Total RPDs
2021	27	36	351	573
2022	52	61	627	857
2023	61	67	688	879
2024	68	73	719	910
2025	79	84	781	952

Statistical Analysis
Descriptive analysis was performed using Microsoft Excel and SPSS (v23.0). Percentage increase and trend growth were calculated as:

$$\%\,\text{Increase} = \frac{(Value_{2025} - Value_{2021})}{Value_{2021}} \times 100$$

Graphical analysis compared ECHS and total complete denture growth trends (Figure 1).

RESULTS

Over the five-year observation period (2021–2025), there was a marked and consistent increase in the number of complete denture replacements performed under the **Ex-Servicemen Contributory Health Scheme (ECHS)**. The annual number of ECHS complete denture cases rose from **27 in 2021 to 79 in 2025**, representing a substantial **192.6% increase**. In comparison, the total number of complete dentures fabricated institutionally across all patient categories (including ECHS and non-ECHS) increased from **351 to 781**, reflecting a comparatively moderate **122.5% growth** during the same period. This distinct difference highlights the accelerated utilization of prosthodontic services within the ECHS beneficiary group relative to the general outpatient population.

A similar pattern of progressive increase was observed for **removable partial dentures (RPDs)**, which also demonstrated steady annual growth in both ECHS and non-ECHS groups, indicating a general upward trend in removable prosthodontic rehabilitation (Table 1). Figure 1 illustrates the comparative growth trajectories for ECHS and total institutional complete denture replacements, revealing a consistent upward trend in both datasets, with a steeper slope for ECHS cases.

The **year-over-year (YoY) comparison** revealed the most pronounced surge between **2021 and 2022**, where ECHS complete denture replacements nearly doubled from 27 to 52 cases—a **92.6% increase** within a single year. This sharp rise is temporally associated with the post–COVID-19 pandemic recovery phase, during which routine and elective dental services resumed across India. The subsequent years (2023–2025) maintained a steady positive trajectory, with smaller yet consistent incremental increases each year.

The **mean annual increment** in ECHS complete denture replacements over the five-year period was **13 cases per year**, compared with an average of **107 cases per year** for total institutional complete dentures. While the absolute number of ECHS patients remains smaller than the general population, the **proportional rate of increase** in ECHS denture replacements was significantly higher, suggesting expanding awareness, accessibility, and trust in ECHS-affiliated prosthodontic services.

This upward utilization trend may be attributed to multiple factors:

1. **Enhanced awareness** of ECHS benefits among retired defence personnel and their families through targeted outreach and digital registration drives.

2. **Improved administrative efficiency** and streamlined referral systems enabling faster authorization and treatment approvals under the ECHS framework.

3. **Increased institutional capacity**, with greater availability of dental materials and prosthodontic technicians following post-pandemic normalization.

4. **Rising patient expectations** for improved comfort, function, and esthetics, prompting earlier replacement of existing prostheses.

Collectively, these findings suggest that ECHS beneficiaries are progressively availing their entitled prosthodontic benefits at a higher rate than before, reflecting both **improved access to care and growing patient engagement** within the publicly funded dental healthcare system.

DISCUSSION

The findings of the present study parallel those reported in international literature, which consistently indicate that complete denture replacements are typically undertaken every **6 to 7 years** on average [9–11]. This interval has been supported across multiple longitudinal and retrospective investigations evaluating prosthesis longevity and clinical outcomes. Taylor et al. (2022) analysed over 187,000 complete denture cases under Australia's publicly funded system and reported a mean denture longevity of approximately **6.06 years**, while Lewis and colleagues (1995) observed similar replacement intervals within the Canadian universal dental plan for the elderly. These results collectively affirm that denture replacement cycles are a natural part of long-term oral rehabilitation, reflecting both biological and mechanical limitations of prosthetic materials and patient adaptation over time.

The pronounced rise in **ECHS denture replacements** observed in this study may be indicative of systemic improvements in service accessibility, quality of care, and patient follow-up mechanisms within empanelled dental centres. Enhanced administrative processes, reduced waiting times, and increased awareness of entitlement benefits likely contributed to higher service utilization. In recent years, digital recordkeeping and e-authorization systems under ECHS have streamlined patient registration and referral, enabling more efficient tracking of prosthodontic needs and outcomes. This infrastructural modernization mirrors trends in other government-sponsored dental schemes worldwide, where digitization has been linked to improved service delivery and continuity of care.

From a clinical perspective, multiple **biological and material factors** are known to necessitate denture replacement over time. Continuous **wear and occlusal deterioration** are among the most common mechanical causes of failure. Studies have demonstrated that artificial acrylic teeth undergo measurable surface wear even within the first few years of use, leading to loss of vertical dimension of occlusion and altered mandibular dynamics [1,2]. These occlusal changes may compromise mastication efficiency and aesthetics, prompting patients to seek replacement dentures earlier than the standard 5–10-year interval. Furthermore, **residual ridge resorption**—a progressive and irreversible process—significantly reduces denture stability and retention, particularly in the mandibular arch [3]. This bone loss alters the fitting surface and retention of the prosthesis, thereby diminishing comfort and functionality.

In addition to clinical wear and resorption, **psychosocial and aesthetic factors** play a vital role in motivating patients to pursue denture replacement. Patient dissatisfaction, stemming from perceived functional decline, aesthetic concerns, or social discomfort, has been well documented as a leading subjective driver for prosthetic renewal [5,6]. Forgie et al. (2005) demonstrated that replacing worn or ill-fitting dentures markedly improved oral health–related quality of life (OHRQoL), speech, and chewing ability, underscoring the psychological dimension of prosthodontic care. Similar outcomes have been observed in multiple gerodontology studies, where replacement dentures restored confidence and enhanced the social reintegration of elderly edentulous individuals [6,7].

Health policy factors also significantly influence the frequency of denture replacements. In systems where dental prostheses are subsidized or publicly funded, as under the ECHS, replacement trends often mirror changes in administrative efficiency and reimbursement frameworks. Structured financial support reduces economic barriers that may otherwise delay or prevent patients from seeking replacement dentures. Studies from **Australia** and **Canada** have reported denture replacement rates of **25–30% within a 10-year window**, largely corresponding with the standard eligibility cycle for publicly funded replacements [9–11]. These findings suggest that reimbursement intervals and eligibility policies have a measurable impact on observed utilization patterns. The increasing trend in ECHS denture replacements therefore supports the hypothesis that **structured government support enhances healthcare access and service uptake** among elderly and retired populations.

The **sociodemographic distribution** of denture replacements observed internationally also helps contextualize the ECHS findings. Previous research has indicated that younger elderly adults (aged 60–75 years) are more likely to seek replacements compared to those above 80 years of age, who often experience barriers such as mobility issues, reduced perceived need, or limited access to care facilities. Moreover, individuals with higher education levels and urban residence tend to report earlier replacement cycles, reflecting both health awareness and ease of access [9,10]. These observations suggest that the upward ECHS replacement trend may also be associated with greater urbanization and increased oral health literacy among the ex-servicemen community.

The improvement in denture replacement frequency under ECHS also aligns with global evidence linking regular prosthesis renewal to enhanced **functional and psychosocial outcomes**. Studies have demonstrated that replacement dentures restore lost vertical dimension, improve masticatory efficiency, and enhance esthetic appearance, all of which contribute to better nutrition, speech, and social engagement [6,7]. Improved OHRQoL scores following denture replacement affirm that timely prosthodontic interventions have tangible impacts on general health and well-being, particularly among elderly individuals reliant on removable prostheses.

However, despite these positive trends, certain limitations persist within the Indian public healthcare framework. Unlike Western public dental schemes that incorporate **structured recall systems** or automatic eligibility reviews, the ECHS currently lacks a standardized recall protocol for prosthodontic evaluation. This absence may lead to **variability in replacement intervals**, as patients often seek replacements only after experiencing significant discomfort or prosthetic failure. Institutional adoption of periodic denture assessment protocols could enhance service consistency and ensure that replacements are performed proactively rather than reactively, improving both clinical outcomes and patient satisfaction.

In summary, the present findings resonate with international evidence indicating that complete denture replacements typically occur every six to seven years and are influenced by both biological and systemic factors. The marked increase in ECHS denture replacements likely reflects a combination of improved accessibility, patient awareness, and policy facilitation. By aligning with global prosthodontic standards and integrating routine follow-up systems, ECHS centers can further enhance the longevity, function, and satisfaction outcomes associated with complete denture therapy in the ex-servicemen population.

LIMITATIONS

This study is limited by its retrospective nature and dependence on institutional records, which lack patient-level variables such as age, satisfaction, and denture longevity. Future studies should incorporate multicentric data and patient-reported outcomes.

CONCLUSIONS

1. Complete denture replacements under ECHS increased by **192.6%** between 2021 and 2025.
2. The rise was greater than that observed in general prosthodontic cases, indicating enhanced utilization of ECHS dental benefits.
3. Findings suggest the need for policy reinforcement and awareness programs targeting prosthodontic maintenance and replacement intervals among veterans.

Clinical Significance
Regular evaluation and timely replacement of dentures are crucial for maintaining function, comfort, and aesthetics. Tracking replacement trends under ECHS can improve dental service planning and ensure equitable prosthetic care for the aging ex-servicemen population.

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Conflict of Interest
None declared.

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Table 1: Trend of Complete Denture Replacements (ECHS vs Total, 2021–2025)