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Effect of removable partial dentures on the periodontal health of abutment and non-abutment teeth: A systematic review

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Abstract

AIM. Removable partial dentures (RPDs) are commonly used to restore function and aesthetics in partially edentulous patients. However, their impact on the periodontal health of abutment teeth remains a concern. This systematic review aimed to assess the periodontal outcomes associated with the use of RPDs, focusing on parameters such as probing depth (PD), gingival index (GI), plaque index (PI), and tooth mobility (TM).

MATERIALS AND METHODS. A systematic search was conducted across multiple databases, including PubMed, Scopus, and Web of Science, to identify studies published from 2000 to 2024. The selection criteria included studies that evaluated periodontal health in patients using RPDs, with a minimum follow-up period of 6 months. Data extraction focused on changes in PD, GI, PI, and TM before and after RPD use. The methodological quality of the included studies was assessed using standard criteria.

RESULTS. A total of *n* = 17 studies were included in this review, encompassing 980 patients. The majority of studies reported an increase in PD and PI in abutment teeth post-RPD insertion, with significant deterioration observed in 12 studies. GI was also noted to worsen in 10 studies, indicating increased gingival inflammation. TM increased in several studies, particularly in those with longer follow-up periods. The findings suggest that RPDs contribute to a decline in periodontal health, particularly in abutment teeth.

CONCLUSIONS. The use of RPDs is associated with adverse periodontal changes in abutment teeth, including increased PD, PI, GI, and TM. These findings underscore the importance of regular periodontal maintenance and careful prosthetic design to mitigate the negative impact of RPDs on periodontal health.

Keywords: removable partial dentures, periodontal health, probing depth, plaque index, gingival index, tooth mobility

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Влияние съемных частичных протезов на пародонтальное здоровье опорных и неопорных зубов: систематический обзор

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Резюме

ЦЕЛЬ. Съемные частичные протезы (СЧП) широко применяются для восстановления функции и эстетики у пациентов с частичной утратой зубов. Однако их влияние на пародонтальное здоровье опорных зубов вызывает беспокойство. Целью данного систематического обзора было оценить пародонтальные

изменения, связанные с использованием СЧП, с акцентом на такие параметры, как глубина зондирования (PD), индекс десен (GI), индекс зубного налета (PI) и подвижность зубов (TM).
МАТЕРИАЛЫ И МЕТОДЫ. Систематический поиск проводился в базах данных PubMed, Scopus и Web of Science для выявления исследований, опубликованных с 2000 по 2024 г. Критерии включения включали исследования, оценивающие пародонтальное здоровье у пациентов, использующих СЧП, с минимальным периодом наблюдения в 6 месяцев. Извлечение данных фокусировалось на изменениях PD, GI, PI и TM до и после использования СЧП. Методологическое качество включенных исследований оценивалось с использованием стандартных критериев.
РЕЗУЛЬТАТЫ. В обзор было включено 17 исследований (*n* = 980 пациентов). Большинство исследований показали увеличение PD и PI у опорных зубов после установки СЧП, при этом значительное ухудшение было отмечено в 12 исследованиях. GI также ухудшился в 10 исследованиях, что указывает на усиление воспаления десен. Увеличение TM наблюдалось в нескольких исследованиях, особенно при более длительных периодах наблюдения. Полученные данные свидетельствуют о том, что использование СЧП приводит к ухудшению пародонтального здоровья, особенно у опорных зубов.
ВЫВОДЫ. Использование СЧП связано с негативными пародонтальными изменениями у опорных зубов, включая увеличение PD, PI, GI и TM. Эти результаты подчеркивают важность регулярного пародонтального ухода и тщательного протезного дизайна для минимизации негативного влияния СЧП на пародонтальное здоровье.

Ключевые слова: съемные частичные протезы, пародонтальное здоровье, глубина зондирования, индекс налета, индекс десен, подвижность зубов

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INTRODUCTION

Removable partial dentures (RPDs) are a widely used prosthetic solution for the rehabilitation of partially edentulous patients, providing an affordable and non-invasive option for restoring function, aesthetics, and speech [1–3]. Despite their advantages, the long-term impact of RPDs on the periodontal health of both abutment and non-abutment teeth has been a subject of ongoing debate within the dental community. The biomechanical forces exerted by RPDs, coupled with potential alterations in the oral environment, may predispose the supporting structures to periodontal disease, a condition that can significantly compromise the longevity and effectiveness of the prosthetic treatment [4; 5].

Abutment teeth, which are crucial in providing support and retention for RPDs, are often subjected to increased stress and plaque accumulation due to the design of clasps, connectors, and other components of the denture [6; 7]. This increased stress can potentially lead to changes in gingival inflammation, PD, and CAL [8–10]. The occlusal forces transmitted through the RPDs may exacerbate these conditions, leading to a higher risk of periodontal breakdown around the abutment teeth compared to non-abutment teeth.

Non-abutment teeth, while not directly involved in the support of the denture, may also experience changes in periodontal health due to altered oral hygiene practices and shifts in the microbial environment [11; 12]. The coverage of the gingival margins by the denture base may impede proper oral hygiene, contributing to plaque accumulation and subsequent periodontal disease.

Various studies have attempted to evaluate the impact of RPDs on the health of the periodontal tissues of the abutment as well as non-abutment teeth. The parameters employed across these studies include gingival index (GI), plaque index (PI), bleeding on probing (BOP), pocket depth (PD), gingival recession (GR), clinical attachment loss (CAL) and tooth mobility (TM) [13].

AIM

The objective of this systematic review is to comprehensively evaluate the existing literature on the impact of RPDs on the periodontal health of both abutment and non-abutment teeth. By synthesizing data from various studies, this review aims to provide a clearer understanding of the potential risks associated with RPDs and to offer insights into how these risks can be mitigated through improved denture design, patient education, and maintenance protocols.

MATERIALS AND METHODS

Search Strategy

The systematic review was conducted and reported in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. A systematic search was conducted across multiple electronic databases, including PubMed, Scopus, Web of Science, and Google Scholar, to identify relevant studies published in the English language between January 2000 and July 2024. The search terms used included combinations of the following keywords: “removable partial dentures”, “periodontal health”, “abutment teeth”, “non-abutment teeth”, “gingival inflammation”, “CAL”, and “plaque accumulation” with Boolean operators (AND, OR). The reference lists of included studies were also manually screened to identify additional relevant articles.

Inclusion and Exclusion Criteria

Studies were included in the review if they met the following criteria:

– Population: Adult patients with partially edentulous arches rehabilitated using RPDs;

– Intervention: Use of removable partial dentures;

– Comparison: Periodontal health outcomes in abutment and non-abutment teeth;

– Outcomes: Gingival inflammation, PD, CAL, and plaque accumulation;

– Study Design: Randomized controlled trials (RCTs), cohort studies, case-control studies, and Cross-sectional studies.

Studies with full text not available in English language or involving patients with systemic conditions affecting periodontal health were excluded from the review. Case reports, reviews, and studies with insufficient data / ambiguity on periodontal outcomes were also excluded.

Data Extraction and Synthesis

Data extraction was performed independently by two teams of reviewers using a pre-standardized data extraction form. The extracted data included study characteristics (author, year, country), study design, sample size, participant demographics, type of RPDs used, duration of follow-up, and periodontal health outcomes for both abutment and non-abutment teeth. Any discrepancies between the reviewers were resolved through discussion and mutual agreement or by consulting a senior reviewer. A qualitative synthesis of the included studies was performed, summarizing the findings in a narrative format.

The quality of the included studies was assessed using the JBI tool for critical appraisal of analytical cross-sectional studies.

RESULTS

Study Selection and Characteristics

A total of 19 studies that investigated the impact of RPDs on the periodontal health of both abutment and non-abutment teeth were included in the final data analysis of the present systematic review [14–32]. The PRISMA flow diagram indicates the study selection process (Fig. 1). The data extracted from these studies related to their study designs, populations, and methods is summarized in Table 1. The studies were conducted in various countries, including Germany, Belgium, Croatia, Japan, Brazil, Iraq, Kosovo, Pakistan, and India, representing a diverse sample population.

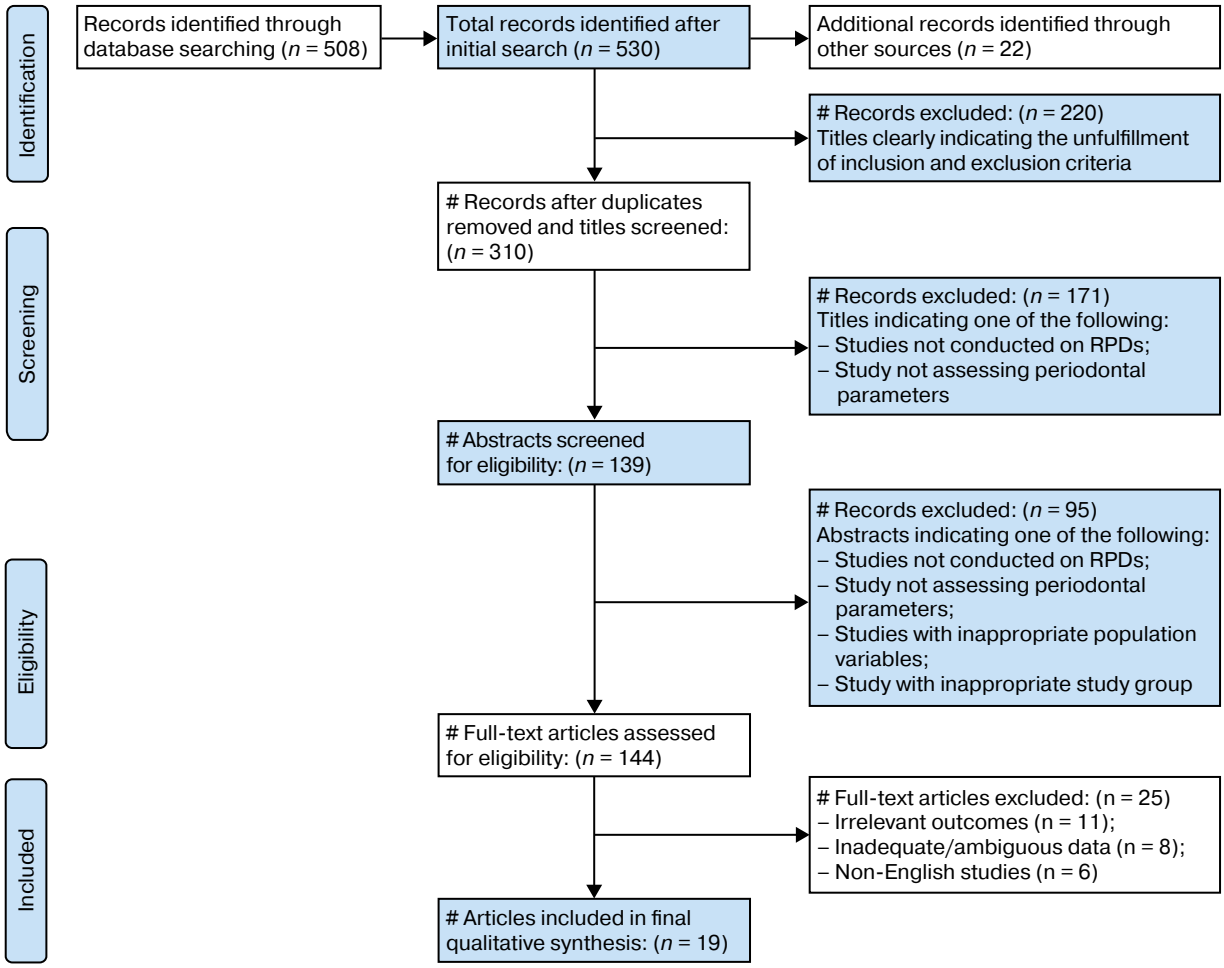

Fig. 1. Study Selection Process

Рис. 1. Процесс отбора исследований

Table 1. Characteristics of the study designs included in the present systematic review

Таблица 1. Характеристики дизайнов исследований, включенных в данный систематический обзор

Sr. No.	Authors, Year	Country	Study Design	Sample Size	Age	Gender Distribution	Type of RPDs Used	RPD Details	Duration of Follow-up	Parameters Assessed
1	Kern et al., 2001 [14]	Germany	Follow-up Study	74 pts with 101 dentures	Adult	Not specified	CCRDs, Clasp-retained RPDs, Combination of CCRDs and RPDs	Clasps on molars, conical crowns on anterior teeth	10 yrs	PD, BOP, PTV
2	Vanzeveren et al., 2002 [15]	Belgium	Longitudinal Study	30 pts	36–74 yrs, avg 59.7	M: 19, F: 11	Cobalt-chromium framework RPDs	Occlusal rests, clasps for retention, saddles with acrylic resin teeth connected by lingual bars or plates	2 yrs	GI, PI I, TM, AL, PD
3	Zlataric et al., 2002 [16]	Croatia	Cross-sectional	205 pts	38–89 yrs	M: 80, F: 125	Varied Kennedy classification, mucosa and tooth-supported	Various maxillary and mandibular designs, predominantly metal frameworks	1–10 yrs	PI, GI, CI, PD, TM, GR
4	Mine et al., 2009 [17]	Japan	Cross-sectional	38 pts	Mean: 62.2 yrs, SD: 6.9	M: 14, F: 24	Unilaterally designed RPDs, Type IV Gold, Co–Cr metal, acrylic resin	Acrylic resin RPDs mostly, some with Type IV Gold and Co–Cr metal frameworks. Different clasp and rest configurations used	12–65 months (Mean: 28.3 months, SD: 14.2 months)	Red complex bacteria, PI, GI, PD, TM
5	Amaral et al., 2010 [18]	Brazil	Longitudinal	50 pts	Average: 45 yrs	M: 18, F: 32	Not specified	Divided into groups of direct retainers, indirect retainers, and control teeth based on their involvement with denture elements	1 yr	PI, GI, PD
6	Dula et al., 2015 [19]	Kosovo	Retrospective Study	64 pts with 91 RPDs	40–64 yrs	M: 36, F: 28	Clasp-retained and attachment RPDs	75 RPDs with clasp-retained, 16 with attachments	5 yrs	PI, CI, BOP, PD, GR, TM
7	Tada et al., 2015 [20]	Japan	Practice-based Cohort Study	192 pts	Median age: 64 yrs	38.5% M, 61.5% F	Clasp-retained RPDs	304 new RPDs, Kaplan–Meier method	7 yrs	Survival of abutment teeth, periodontal maintenance
8	Almeida et al., 2015 [21]	Brazil	Cross-sectional	45 pts	20–75 yrs	Not specified	Ackers' clasp, Bar clasp	Assessed RPD hygiene with Tarbet Index, type of clasp on abutment teeth	2 yrs	PD, CAL, PI, GI, RPD hygiene
9	Carreiro et al., 2016 [22]	Brazil	Longitudinal Comparative Study	22 pts	Mean age: 52.67 yrs	22.7% M, 77.3% F	Tooth-supported and tooth-mucosa-supported RPDs	Maxillary and mandibular arches	7 yrs	GR, PD, BOP, Tooth integrity
10	Costa et al., 2016 [23]	Brazil	Longitudinal Study	11 pts	Mean age: 53.3 yrs	100% F	Mandibular distal free-end RPDs	3 bilateral, 8 unilateral	6 months	Microbial genome counts, PD, GR, BOP
11	Fayyad et al., 2017 [24]	Egypt	Randomized Clinical Trial	28 pts	Not specified	35.7% M, 64.3% F	Conventional and Telescopic RPDs	Mandibular Kennedy class I arches	1 yr	PD, Alveolar bone height

Table 1. (Eng) / **Таблица 1**. (Окончание)

Sr. No.	Authors, Year	Country	Study Design	Sample Size	Age	Gender Distribution	Type of RPDs Used	RPD Details	Duration of Follow-up	Parameters Assessed
12	Kazem et al., 2017 [25]	Iraq	Comparative Study	26 pts	30–59 yrs	38.5% F, 61.5% M	RPDs	Not specified	3–12 months	PI, GI, PD
13	Dula et al., 2019 [26]	Kosovo	Longitudinal	107 pts	33-80 yrs	M: 58, F: 49	Clasp-retained and attachment RPDs	87 clasp-retained, 51 with attachments	3 months	PLI, CI, BOP, PD, TM
14	Yadav et al., 2019 [27]	India	Longitudinal	50 pts	Not specified	Not specified	RPDs	RPD for mandibular first and second molar replacement	2 yrs	PI, GI, CAL
15	Almeida et al., 2020 [28]	Brazil	Longitudinal Study	14 pts	Mean age: 66 yrs (± 7.8)	M: 3 (21.4%), F: 11 (78.6%)	Mandibular Kennedy Class I RPDs	T-bar clasps with occlusal rests on mesial surfaces, lingual plate or lingual bar connectors	48 months	PI, BOP, PD, GR, CAL, KM
16	Shafiq et al., 2022 [29]	Pakistan	Descriptive Case Series	65 abutments	Mean age: 49.22±6.64 yrs	M: 52.3%, F: 47.7%	ARPDs	Cast metal alloy (Co/Cr) clasp assembly, full coverage acrylic lingual plate, and palatal plate/strap major connectors	60 days	CAL, TM, GI
17	Bukleta et al., 2023 [30]	Kosovo	Prospective Clinical Study	40 pts	45–65 yrs	M: 40%, F: 60%	ARPDs, MRPDs	ARPD: Acrylic base, MRPD: Metallic framework	12 months	MPD, MAL, PLAQ, BOP, CRP, ALP, MOB
18	Hussain et al., 2024 [31]	Pakistan	Quasi-experimental study	90 pts	20–40 yrs	M: 43.3%, F: 56.6%	ARPDs	Specific design used at AFID	30 days	PI, GI, PPD
19	Ullah et al., 2024 [32]	Pakistan	Cross-sectional study	145 pts	40–64 yrs	M: 36%, F: 28%	RPDs	Specific design used at Bacha Khan Medical College	6 months	PD, TM

Abbreviations: PD: Probing Depth; BOP: Bleeding on Probing; PTV: Periotest Values; GI: Gingival Index; PI I: Plaque Index; TM: Tooth Mobility; AL: Attachment Level; PI: Plaque Index; CI: Clinical Index; GR: Gingival Recession; CAL: Clinical Attachment Level; RPD: Removable Partial Denture; CCRD: Conical Crown-Retained Denture; M: Male; F: Female; ARPD: Acrylic Removable Partial Denture; MRPD: Metallic Removable Partial Denture; MPD: Mean Probing Depth; MAL: Mean Attachment Level; PLAQ: Plaque; CRP: C-Reactive Protein; ALP: Alkaline Phosphatase; MOB: Mobility; PPD: Probing Pocket Depth

The sample sizes of the included studies ranged from 11 to 205 participants, with ages varying between 20 and 89 years. The studies employed various research designs, including 5 cross-sectional studies, 6 longitudinal studies, 2 retrospective studies, 3 prospective clinical studies, 1 practice-based cohort study, and 2 randomized clinical trials. The types of RPDs examined included both acrylic and metallic frameworks, with different designs such as clasp-retained, attachment-retained, and conical crown-retained dentures (CCRDs).

The following text provides a brief account of the outcomes reported by the various studies included in the present systematic review. An overall presentation of these outcomes is tabularized in Table 2.

Impact on Abutment Teeth

Probing Depth: Except for one study, 13 out of the 14 studies that assessed PD reported a significant increase in probing depth in abutment teeth after RPD insertion. For instance, Kern et al. reported an increase in mesial probing depth from 2.7 mm to 3.1 mm over a 10-year period [14], and Vanzeveren et al. observed an increase from 2.2 mm to 2.7 mm over 2 years [15].

Plaque Index: 12 of the 13 studies that measured PI noted a significant increase in plaque accumulation around abutment teeth post-RPD use. Hussain et al., for example, documented a rise in PI from 0.39 to 1.21 within 30 days of RPD use, [31] while Mine et al. recorded an increase from 1.2 to 2.0 over a mean follow-up period of 28.3 months [17].

Table 2. Characteristics of the outcomes of the studies included in the present systematic review

Таблица.2. Характеристики результатов исследований, включенных в данный систематический обзор

Serial No.	Author (s) and Year	Baseline Abutment Teeth	After RPD Use – Abutment Teeth	Baseline Non-Abutment Teeth	After RPD Use – Non-Abutment Teeth	Key Findings
1	Kern et al., 2001 [14]	PD Mesial: 2.8 mm, PD Distal: 2.7 mm, PTV: 10.6	PD Mesial: 3.1 mm, PD Distal: 3.0 mm, PTV: 13.1	PD Mesial: 2.8 mm, PD Distal: 2.7 mm, PTV: 10.6	PD Mesial: 2.8 mm, PD Distal: 2.7 mm, PTV: 11.7	Increased PD and PTV over 10 yrs; more pronounced in abutment teeth than in non-abutment teeth. Higher extraction rates in abutment teeth (26.4%) compared to non-abutment teeth (14.2%)
2	Vanzeveren et al., 2002 [15]	GI: 1.2, PI I: 1.4, PD: 2.2 mm	GI: 2.1, PI I: 2.0, PD: 2.7 mm	GI: 1.1, PI I: 1.2, PD: 2.0 mm	GI: 1.8, PI I: 1.7, PD: 2.5 mm	No significant long-term changes in TM; Periodontal health influenced by RPD use, especially noticeable in non-abutment teeth regarding PD and AL
3	Zlataric et al., 2002 [16]	PI: 1.2, GI: 1.4, PD: 1.8 mm, TM: 0.5 mm, GR: 0.5 mm	PI: 2.0, GI: 2.2, PD: 2.4 mm, TM: 1.0 mm, GR: 1.0 mm	PI: 1.0, GI: 1.2, PD: 1.6 mm, TM: 0.3 mm, GR: 0.3 mm	PI: 1.5, GI: 1.8, PD: 2.0 mm, TM: 0.7 mm, GR: 0.6 mm	Significant periodontal health impact on abutment teeth compared to non-abutment teeth; design and maintenance of RPD crucial for periodontal health
4	Mine et al., 2009 [17]	PI: 1.2, GI: 1.4, PD: 2.0 mm, TM: 0.5 mm	PI: 2.0, GI: 2.2, PD: 2.5 mm, TM: 1.0 mm	PI: 1.0, GI: 1.2, PD: 1.8 mm, TM: 0.4 mm	PI: 1.5, GI: 1.8, PD: 2.2 mm, TM: 0.8 mm	Abutment teeth showed significantly higher PI, GI, TM, and red complex presence compared to non-abutment teeth. Regular oral maintenance identified as crucial for managing microbiological risks associated with periodontitis in RPD wearers
5	Amaral et al., 2010 [18]	PI: 1.5, GI: 1.8, PD: 2.2 mm	PI: 2.3, GI: 2.5, PD: 3.0 mm	PI: 1.3, GI: 1.5, PD: 2.0 mm	PI: 1.8, GI: 2.0, PD: 2.5 mm	Teeth involved in RPDs demonstrated more periodontal issues. PI significantly increased over the year across all groups. No significant differences in periodontal conditions but notable differences in PI among the groups
6	Dula et al., 2015 [19]	PI: Higher in clasp-retained	No significant difference in periodontal parameters between RPD designs except GR-index which was significantly higher in clasp-retained RPDs	Not Assessed	Not Assessed	RPD with clasp increased levels of gingival inflammation in regions covered by the dentures and below the clasp arms in abutment teeth. Regular maintenance and proper design can prevent periodontal diseases of abutment teeth
7	Tada et al., 2015 [20]	3–6M group: 7-year cumulative survival rate: 83.7%	3–6M group: 7-year cumulative survival rate: 83.7%	1Y group: 7-year cumulative survival rate: 75.5%	1Y group: 7-year cumulative survival rate: 75.5%	Frequent periodontal maintenance (every 3–6 months) had the most favorable outcome for abutment tooth survival. The no-maintenance group had the poorest outcome
8	Almeida et al., 2015 [21]	PD: 3.53 mm, CAL: 1.31 mm, PI: 2.0, GI: 2.2	PD: 3.53 mm, CAL: 1.31 mm, PI: 2.0, GI: 2.2	PD: 3.08 mm, CAL: 1.08 mm, PI: 1.8, GI: 2.0	PD: 3.08 mm, CAL: 1.08 mm, PI: 1.8, GI: 2.0	Higher PD and CAL in abutment teeth compared to non-abutment teeth. Most prostheses showed poor hygiene and high plaque levels. No significant difference in periodontal status of abutment vs. non-abutment teeth due to RPD use
9	Carreiro et al., 2016 [22]	GR: Direct abutment: 0.42 mm, Indirect abutment: 0.59 mm	GR: Direct abutment: 0.83 mm, Indirect abutment: 0.59 mm	GR: Control: 0.00 mm	GR: Control: 0.33 mm	RPDs caused more periodontal damage to direct abutments compared to indirect abutments and non-abutments. Significant increase in GR and PD was observed
10	Costa et al., 2016 [23]	PD: 1–3 mm, GR: Minimal	PD: 2–3 mm, GR: 1.3 mm	Not specified	Not specified	Both total and individual microbial counts significantly increased after 6 months. GR increased in abutment teeth
11	Fayyad et al., 2017 [24]	PD: Group I: 8.62 mm, Group II: 7.02 mm	PD: Group I: 9.20 mm, Group II: 10.52 mm	Not applicable	Not applicable	Telescopic RPDs showed more gingival inflammation and increased PD compared to conventional RPDs. Bone loss was minimal and not statistically significant
12	Kazem et al., 2017 [25]	PI: Control: 1.06	PI: Study group: 1.66	PD: Control: 0.02 mm	PD: Study group: 0.05 mm	Significant increase in PI for RPD wearers compared to non-wearers. No significant differences in GI and PD

Table 2. (Eng) / **Таблица 2**. (Окончание)

Serial No.	Author (s) and Year	Baseline Abutment Teeth	After RPD Use – Abutment Teeth	Baseline Non-Abutment Teeth	After RPD Use – Non-Abutment Teeth	Key Findings
13	Dula et al., 2019 [26]	PLI: 0.07 ± 0.26	PLI: 1.20 ± 0.46	PLI: 0.06 ± 0.24	PLI: 0.75 ± 0.64	Significant differences in PLI, BOP, and PD between abutment and non-abutment teeth after 3 months of RPD wear. No significant differences in TM and CI. Regular maintenance and good oral hygiene are crucial for preventing periodontal diseases in RPD wearers
14	Yadav et al., 2019 [27]	PI: 1.61	PI: 1.29	GI: 1.48	GI: 1.37	Improper oral hygiene led to significant increases in PI and CAL in RPD group compared to control. Non-significant differences in GI were observed between RPD and control groups
15	Almeida et al., 2020 [28]	PI: Direct abutment: 87.5%, Indirect abutment: 79.17%	PI: Direct abutment: 56.25%, Indirect abutment: 53.13%	Not applicable	Not applicable	Non-surgical periodontal therapy was effective during the first 18 months, but periodontal conditions worsened by 48 months. Distal sites of abutment teeth with direct retainers presented the worst periodontal conditions
16	Shafiq et al., 2022 [29]	CAL: 1.55 mm	CAL: 1.72 mm on 30th day, 1.71 mm on 60th day	Not applicable	Not applicable	Statistically insignificant effects on CAL and GI. TM increased slightly on 30th day but returned to normal by 60th day. Regular recall visits and proper denture hygiene are critical for maintaining periodontal health
17	Bukleta et al., 2023 [30]	MPD: 0.195 (MRPD), 0.185 (ARPD)	MPD: 0.225 (MRPD), 0.240 (ARPD)	MPD: 0.360 (MRPD), 0.350 (ARPD)	MPD: 0.490 (MRPD), 0.505 (ARPD)	MRPDs had higher PLAQ scores compared to ARPDs. ARPD users had higher BOP values. No significant differences were found in mobility or biochemical markers (CRP, ALP) between ARPD and MRPD users. The study supports the use of ARPDs as a temporary solution for up to 1 year
18	Hussain et al., 2024 [31]	PI: 0.39 ± 0.03	PI: 1.21 ± 0.07	Not Assessed	Not Assessed	Significant worsening of gingival health and plaque index scores 30 days post-insertion of ARPDs. No significant differences were found between age, gender, or smoking status groups
19	Ullah et al., 2024 [32]	PD: 0.28 ± 0.04 mm, TM: 0.26 ± 0.03 mm	Significant association between PD and TM post-RPD use ($p < 0.05$)	Not Assessed	Not Assessed	Significant impact on periodontal health was observed. The study suggests a link between probing depth and tooth mobility with RPD use, emphasizing the importance of oral hygiene and proper RPD design

Abbreviations: PD: Probing Depth; BOP: Bleeding on Probing; PTV: Periotest Values; GI: Gingival Index; PI I: Plaque Index; TM: Tooth Mobility; AL: Attachment Level; PI: Plaque Index; CI: Clinical Index; GR: Gingival Recession; CAL: Clinical Attachment Level; RPD: Removable Partial Denture; CCRD: Conical Crown-Retained Denture; M: Male; F: Female; ARPD: Acrylic Removable Partial Denture; MRPD: Metallic Removable Partial Denture; MPD: Mean Probing Depth; MAL: Mean Attachment Level; PLAQ: Plaque; CRP: C-Reactive Protein; ALP: Alkaline Phosphatase; MOB: Mobility; PPD: Probing Pocket Depth

Gingival Index: 10 out of 11 studies that assessed GI reported a significant increase in gingival inflammation in abutment teeth. Amaral et al. observed an increase in GI from 1.8 to 2.5 over one year, [18] while Hussain et al. reported an increase from 0.19 to 1.50 in just 30 days [31].

Bleeding on Probing: 8 of the 9 studies that evaluated BOP showed increased BOP in abutment teeth post-RPD use. Bukleta et al. found that acrylic RPD (ARPD) users had higher BOP values (2.55) compared to metallic RPD (MRPD) users (2.00), indicating a higher degree of gingival inflammation in ARPD users [30].

Tooth mobility: 9 out of 10 studies that assessed TM noted a significant increase in TM in abutment teeth associated with RPD use. Dula et al. reported increased TM in patients with clasp-retained RPDs compared to those with attachment-retained RPDs [19]. Ullah et al. observed a significant correlation between increased PD and TM in their study population [32].

Clinical Attachment Level: All 6 studies that measured CAL reported an increase in CAL in abutment teeth. Shafiq et al. documented a slight increase in CAL from 1.55 mm to 1.72 mm after 30 days of ARPD use [29],

while Carreiro et al. observed more significant attachment loss in direct abutment teeth compared to indirect abutments and non-abutment teeth [17].

Gingival Recession: 4 out of 5 studies that assessed GR reported increased GR in abutment teeth. Carreiro et al. found that direct abutments experienced more significant GR (from 0.42 mm to 0.83 mm) compared to indirect abutments and non-abutment teeth [22].

Periotest Values: Kern et al. was the only study that assessed PTV, reporting an increase from 10.6 to 13.1 over 10 years, indicating a deterioration in periodontal support of abutment teeth [14].

Biochemical Markers and Microbial Assessments: Both studies assessing CRP and ALP, including Bukleta et al., found no significant differences between ARPD and MRPD users. However, increased inflammatory markers were noted overall in RPD users [30]. Costa et al. and Mine et al. reported significant increases in microbial counts, including red complex bacteria, associated with increased periodontal inflammation in abutment teeth post-RPD use [17; 23].

Comparison with Non-Abutment Teeth

Non-abutment teeth generally exhibited less increase in probing depth compared to abutment teeth. For example, Zlataric et al. reported a probing depth increase from 1.6 mm to 2.0 mm in non-abutment teeth, which was less pronounced than the increase seen in abutment teeth [16]. Non-abutment teeth consistently showed lower plaque and gingival indices compared to abutment teeth. Mine et al. recorded a PI of 1.5 in non-abutment teeth compared to 2.0 in abutment teeth, demonstrating better periodontal health in non-abutment teeth [17]. Studies generally reported no significant increase in TM in non-abutment teeth compared to abutment teeth. For instance, Dula et al. found minimal changes in TM in non-abutment teeth over 5 years [19].

Influence of RPD Design and Maintenance

The design and maintenance of RPDs were found to be critical factors in determining the extent of periodontal damage. Studies such as Dula et al. and Fayyad et al. indicated that clasp-retained RPDs were associated with higher plaque accumulation, increased GR, and greater TM compared to attachment-retained RPDs [19; 24]. Tada et al. highlighted the importance of regular periodontal maintenance, showing that patients who received maintenance every 3–6 months had significantly better periodontal outcomes than those who did not receive regular maintenance [20]. Bukleta et al. compared ARPDs with MRPDs, finding that ARPD users had higher BOP values, while MRPD users had higher plaque scores, suggesting that the material of the RPD may influence specific periodontal parameters [30].

Table 3. Risk of bias of the included studies according to the JBI tool for cross-sectional studies

Таблица 3. Оценка риска систематической ошибки в включенных исследованиях согласно инструменту JBI для поперечных исследований

Author (s) and Year	Were the criteria for inclusion in the sample clearly defined?	Were the study subjects and the setting described in detail?	Was the exposure measured validly and reliably?	Were objective, standard criteria used for measurement of the condition?	Were confounding factors identified?	Were strategies to deal with confounding factors stated?	Were the Outcomes measured validly and reliably?	Was appropriate statistical analysis used?	Quality of Evidence
Kern et al., 2001 [14]	Yes	Unclear	Unclear	Unclear	No	Yes	Yes	Yes	Moderate
Vanzeveren et al., 2002 [15]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	High
Zlataric et al., 2002 [16]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	High
Mine et al., 2009 [17]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	High
Amaral et al., 2010 [18]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	High
Dula et al., 2015 [19]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	High
Tada et al., 2015 [20]	Yes	Yes	Yes	Yes	No	Yes	Unclear	Yes	Moderate
Almeida et al., 2015 [21]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	High
Carreiro et al., 2016 [22]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	High
Costa et al., 2016 [23]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	High
Fayyad et al., 2017 [24]	Yes	Yes	Unclear	Unclear	No	Yes	Yes	Yes	Moderate
Kazem et al., 2017 [25]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Unclear	Moderate
Dula et al., 2019 [26]	Yes	Yes	Unclear	Unclear	No	Yes	Yes	Yes	High
Yadav et al., 2019 [27]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	High
Almeida et al., 2020 [28]	Yes	Yes	Unclear	Unclear	Yes	Yes	Yes	Unclear	Moderate
Shafiq et al., 2022 [29]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	High
Bukleta et al., 2023 [30]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	High
Hussain et al., 2024 [31]	Yes	Yes	Yes	Unclear	Unclear	Yes	Yes	Yes	Moderate
Ullah et al., 2024 [32]	Yes	Yes	Unclear	Unclear	No	Yes	Unclear	Yes	Low

Overall, findings of the present systematic review indicated that RPDs, particularly clasp-retained designs, were associated with adverse effects on the periodontal health of abutment teeth, including increased probing depth, plaque and gingival indices, TM, and GR. Non-abutment teeth generally fared better but were not immune to the negative impacts of RPD use. The design of the RPD and the frequency of periodontal maintenance were critical in mitigating these adverse effects. Regular maintenance, proper RPD design, and material selection are essential to minimizing the periodontal damage associated with RPD use.

The risk of bias and quality of evidence for all the included studies is provided in Table 3.

DISCUSSION

The findings of this systematic review revealed the significant impact that RPDs can have on the periodontal health of abutment teeth, which is a critical concern in prosthodontic treatment. Across the studies reviewed, a consistent pattern emerged, highlighting the detrimental effects of RPDs, particularly those retained by clasps, on the periodontium. The increased plaque accumulation, gingival inflammation, and probing depth observed in abutment teeth compared to non-abutment teeth is a recurring theme in the literature. These findings reflect the challenges posed by the mechanical and biological interactions between RPDs and the oral environment, emphasizing the need for meticulous design and maintenance of these prostheses.

One of the most striking outcomes was the increase in PD and GR associated with RPD use. Studies such as those by Kern et al. and Dula et al. reported significant increases in PD and GR in abutment teeth over time, with some studies observing these changes within just a few months of RPD insertion [14; 19]. This suggests that the design and maintenance of RPDs are crucial in mitigating these adverse outcomes. The biomechanical forces exerted by RPDs, particularly those with clasps, appear to contribute to the deepening of periodontal pockets and the recession of the gingiva, which can compromise the long-term viability of abutment teeth [5]. These findings align with previous research indicating that the design and material of RPDs play a pivotal role in determining their impact on periodontal health [5; 9].

The review also highlighted the importance of regular maintenance and oral hygiene practices in patients with RPDs. Tada et al. and Carreiro et al. both emphasized that frequent periodontal maintenance visits were associated with better outcomes in terms of abutment tooth survival and overall periodontal health [20; 22]. This finding underscores the necessity of patient education and the implementation of rigorous maintenance protocols to prevent the progression of periodontal disease in RPD wearers. However, despite these measures, some studies, like those by Hussain et al., still reported significant worsening of periodontal parameters even with relatively short follow-up periods, indicating that RPDs inherently pose a risk to periodontal health, which can be difficult to completely mitigate [31].

TM was another parameter that showed considerable variation across the studies. The findings from Ullah et al. and Kazem et al. suggest that while some RPD designs can lead to an increase in TM, this effect is not uniformly observed across all studies or patient populations [25; 32]. Factors such as the duration of RPD use, the design of the denture, and the type of abutment teeth may influence the degree of mobility observed [7]. The variation in TM outcomes highlights the complex interplay between RPD design and periodontal health, suggesting that more refined design strategies may be necessary to minimize this adverse effect. Additionally, it was noted that non-abutment teeth were generally less affected, though they were not entirely spared from periodontal deterioration, particularly in the presence of poor oral hygiene.

The review also brought to light the role of biochemical markers, such as C-reactive protein and alkaline phosphatase, in monitoring the systemic effects of RPDs. Although studies like Bukleta et al. did not find significant differences in these markers between different types of RPDs, the limited number of studies assessing these biomarkers suggests that further research is needed to fully understand the systemic implications of RPD use [30]. These markers could potentially serve as valuable tools for early detection of systemic inflammatory responses in patients using RPDs, aiding in the prevention of more severe periodontal and systemic conditions.

Another key finding is the role of RPD design in influencing periodontal outcomes. Studies consistently reported that RPDs with clasp retention were associated with worse periodontal outcomes compared to those with attachment-based designs. For example, Dula et al. found that RPDs with clasps led to higher plaque indices, probing depths, and GR compared to attachment-retained RPDs [19]. This suggests that while clasps provide effective retention, they may do so at the cost of increased periodontal stress, which can exacerbate plaque accumulation and gingival inflammation [24; 31]. The mechanical irritation caused by clasps, coupled with their tendency to trap plaque, could explain the higher rates of periodontal complications associated with these designs.

The evidence from this review also points to the potential for RPDs to cause more harm to abutment teeth than non-abutment teeth. This differential impact underscores the need for careful selection of abutment teeth and the consideration of alternative prosthetic options, such as fixed partial dentures or implant-supported prostheses, especially in patients with pre-existing periodontal issues. The higher extraction rates observed in abutment teeth across several studies further highlight the long-term risks associated with RPD use, emphasizing the importance of thorough patient assessment and tailored treatment planning [14–17].

Despite these insights, the systematic review also revealed several limitations inherent in the studies reviewed. Many of the included studies were of cross-sectional or retrospective design, which limits the ability to establish causal relationships between RPD use

and periodontal outcomes. Additionally, the variation in study designs, sample sizes, and follow-up periods across the studies makes it challenging to draw definitive conclusions. The heterogeneity in the types of RPDs evaluated, ranging from acrylic to metallic frameworks with various retention mechanisms, further complicates comparisons between studies. Moreover, some studies did not control for confounding factors such as smoking, systemic diseases, or variations in oral hygiene practices, which could have influenced the outcomes. The relatively short follow-up periods in some studies also raise concerns about the long-term applicability of the findings, as periodontal changes may become more pronounced over time. Finally, the lack of standardized reporting on key periodontal parameters across studies limits the ability to perform meta-analyses or more sophisticated statistical comparisons.

Overall, while the findings of this systematic review provide valuable insights into the impact of RPDs on periodontal health, they also highlight the need for more longitudinal studies with standardized methodologies to better understand the complex interactions between RPDs and the periodontium. Future research should focus on identifying the optimal design features of RPDs that minimize periodontal damage, as well as exploring the potential of alternative prosthetic solutions that offer better periodontal outcomes. Additionally, the development of comprehensive maintenance protocols tailored to RPD wearers could play a crucial role in preserving the periodontal health of these patients over the long term.

CONCLUSION

Findings of the present systematic review highlight the significant impact that RPDs can have on the periodontal health of abutment teeth, with evidence pointing to increased PD, GR, CAL, TM, and plaque accumulation associated with RPD use, particularly those with clasp retention. The findings also reinforce the importance of an optimal RPD design, regular maintenance, and proper oral hygiene practice to mitigate these adverse effects.

REFERENCES / СПИСОК ЛИТЕРАТУРЫ

1. Xie Q., Ding T., Yang G. Rehabilitation of oral function with removable dentures – still an option? *J Oral Rehabil*. 2015;42(3):234–242. https://doi.org/10.1111/joor.12246
2. Qamar Z., Alghamdi A.M.S., Haydarah N.K.B., Balateef A.A., Alamoudi A.A., Abumismar M.A. et al. In vitro evaluation of lithium disilicate endocrowns and post and core crowns-a systematic review. *J Funct Biomater*. 2023;14(5):276. https://doi.org/10.3390/jfb14050276
3. Mall V., Banga P.S., Sachdev S.S., Shekatkar Y., Dole V., Banga J.K. Knowledge and attitude of patients with edentulism pertaining to various treatment modalities: A cross-sectional survey in Navi Mumbai. *Int J Orofac Res.* 2022;6(1):11–18. https://doi.org/10.56501/intjorofacres.v6i1.144
4. Pai B.S.J., Krishnan N.R., Walveker A., Keeneri S., Emmanuel A., Krishnan N.R., Lira M.A. Comparative evaluation of sclerostin levels in gingival crevicular fluid in the treatment of chronic periodontitis patients using diode laser as an adjunct to scaling and root planing: A clinico-biochemical study. *Contemp Clin Dent*. 2021;12(3):276–281. https://doi.org/10.4103/ccd.ccd_19_20
5. Bural A.C. Biomechanics of removable partial dentures. In: Şakar O. (eds) *Removable Partial Dentures*. Springer, Cham; 2024, pp. 29–40. https://doi.org/10.1007/978-3-031-47083-7_4
6. Yerte S.B., Kulloli A., Mehta V., Mathur A., Cicciù M., Fiorillo L. Clinical efficacy of concentrated growth factors for the management of marginal tissue recession: A systematic review and meta-analysis. *J Craniofac Surg*. 2024;35(7):2177–2183. https://doi.org/10.1097/SCS.0000000000010312
7. Radnai M., Saini R., Gorzo I. Removable partial denture with bar or plate: How should we decide? *Int J Exp Dent Sci*. 2013;2(2):104–108. https://doi.org/10.5005/jp-journals-10029-1050
8. Bagwe S., Mehta V., Mathur A., Kumbhalwar A., Bhati A. Role of various pharmacologic agents in alveolar bone regeneration: A review. *Natl J Maxillofac Surg*. 2023;14(2):190–197. https://doi.org/10.4103/njms.njms_436_21
9. McHenry K.R., Johansson O.E., Christersson L.A. The effect of removable partial denture framework design on gingival inflammation: A clinical model. *J Prosthet Dent*. 1992;68(5):799–803. https://doi.org/10.1016/0022-3913(92)90205-o
10. Mehta V., Mathur A., Tripathy S., Sa R., Sharma T. Effectiveness of herbal oral care products in reducing dental plaque and gingivitis: an overview of systematic reviews. *Can J Dent Hyg*. 2024;58(2):120–134.
11. Tada S., Ikebe K., Matsuda K., Maeda Y. Multifactorial risk assessment for survival of abutments of removable partial dentures based on practice-based longitudinal study. *J Dent*. 2013;41(12):1175–1180. https://doi.org/10.1016/j.jdent.2013.07.018
12. Preshaw P.M., Walls A.W., Jakubovics N.S., Moynihan P.J., Jepson N.J., Loewy Z. Association of removable partial denture use with oral and systemic health. *J Dent*. 2011;39(11):711–719. https://doi.org/10.1016/j.jdent.2011.08.018
13. Dikilitaş A., Karaaslan F., Evirgen Ş., Ertuğrul A.S., Kamburoğlu K. Evaluation of the effects of periodontal status according to 2017 classifications on oral health-related quality of life and quality of life-related to general health: A cross-sectional study. *Int J Dent Hyg*. 2024;22(3):672–680. https://doi.org/10.1111/idh.12753
14. Kern M., Wagner B. Periodontal findings in patients 10 years after insertion of removable partial dentures. *J Oral Rehabil*. 2001;28(11):991–997. https://doi.org/10.1046/j.1365-2842.2001.00788.x
15. Vanzeveren C., D'Hoore W., Bercy P. Influence of removable partial denture on periodontal indices and microbiological status. *J Oral Rehabil*. 2002;29(3):232–239. https://doi.org/10.1046/j.1365-2842.2002.00854.x
16. Zlatarić D.K., Celebić A., Valentić-Peruzović M. The effect of removable partial dentures on periodontal health of abutment and non-abutment teeth. *J Periodontol*. 2002;73(2):137–144. https://doi.org/10.1902/jop.2002.73.2.137

17. Mine K., Fueki K., Igarashi Y. Microbiological risk for periodontitis of abutment teeth in patients with removable partial dentures. *J Oral Rehabil*. 2009;36(9):696–702. https://doi.org/10.1111/j.1365-2842.2009.01982.x
18. do Amaral B.A., Barreto A.O., Gomes Seabra E., Roncalli A.G., da Fonte Porto Carreiro A., de Almeida E.O. A clinical follow-up study of the periodontal conditions of RPD abutment and non-abutment teeth. *J Oral Rehabil*. 2010;37(7):545–552. https://doi.org/10.1111/j.1365-2842.2010.02069.x
19. Dula L.J., Ahmedi E.F., Lila-Krasniqi Z.D., Shala K.Sh. Clinical evaluation of removable partial dentures on the periodontal health of abutment teeth: a retrospective study. *Open Dent J*. 2015;9:132–139. https://doi.org/10.2174/1874210601509010132
20. Tada S., Allen P.F., Ikebe K., Matsuda K., Maeda Y. Impact of periodontal maintenance on tooth survival in patients with removable partial dentures. *J Clin Periodontol*. 2015;42(1):46–53. https://doi.org/10.1111/jcpe.12320
21. de Almeida A.L., Catalani D.T., Garcia de Oliveira P.C., Soares S., Tunes F.S., Neppelenbroek K.H. Assessment of periodontal and hygiene conditions of removable partial dentures in individuals with clefts. *Cleft Palate Craniofac J*. 2016;53(6):727–731. https://doi.org/10.1597/15-072
22. da Fonte Porto Carreiro A., de Carvalho Dias K., Correia Lopes A.L., Bastos Machado Resende C.M., Luz de Aquino Martins A.R. Periodontal conditions of abutments and non-abutments in removable partial dentures over 7 years of use. *J Prosthodont*. 2017;26(8):644–649. https://doi.org/10.1111/jopr.12449
23. Costa L., do Nascimento C., de Souza V.O., Pedrazzi V. Microbiological and clinical assessment of the abutment and non-abutment teeth of partial removable denture wearers. *Arch Oral Biol*. 2017;75:74–80. https://doi.org/10.1016/j.archoralbio.2016.11.002
24. Fayyad A., Nassouhy N. Comparison between the effect of conventional removable partial dentures and telescopic removable partial dentures on PDs and alveolar bone height of abutment teeth. *Egypt Dent J.* 2017;63(1):1019–1026. https://doi.org/10.21608/edj.2017.75256
25. Kazem N.M., Talal Abd S., Abdulla W.L., Al-Qader Dawood M.A., Admon M., Sabah M. The effect of removable partial denture on periodontal health status. *Global Journal of Bio-Science and Biotechnology*. 2017;6(3):512–515.
26. Dula L.J., Shala K.S., Pustina-Krasniqi T., Bicaj T., Ahmedi E.F. The influence of removable partial dentures on the periodontal health of abutment and non-abutment teeth. *Eur J Dent*. 2015;9(3):382–386. https://doi.org/10.4103/1305-7456.163234
27. Yadav A.K., Yadav R., Kishlay K., Singh S., Dube P. Periodontal health status in RPD wearing patients visiting to dental hospital in Azamgarh. *J Adv Med Dent Sci Res*. 2019;7(1):22–27.
28. Almeida M.L., de Oliveira É.P.S., Tôrres C.S.P., Calderon P.D.S., Carreiro A.D.F.P., Gurgel B.C.V. Evaluation of periodontal parameters on Removable Partial Denture abutment teeth with direct and indirect retainers: A 48-month follow-up. *J Int Acad Periodontol*. 2020;22(2):10–17.
29. Shafiq S., Yazdanie N. Effects of acrylic removable partial dentures on periodontal health of abutment teeth. *Prof Med J.* 2022;29(3):382–388. https://doi.org/10.29309/TPMJ/2022.29.03.6109
30. Bukleta M.S., Selmani M., Bukleta D. Comparison of the impact of two types of removable partial dentures on the periodontal health of the remaining teeth: A prospective clinical study. *Clin Exp Dent Res*. 2023;9(4):557–567. https://doi.org/10.1002/cre2.738
31. Hussain S., Amjad A., Sharif M., Tasleem R. Gingival health status of abutment teeth in acrylic removable partial denture. *J Bahria Univ Med Dent Coll*. 2024;14(2):118–122. https://doi.org/10.51985/JBUMDC2023296
32. Ullah H., Mansur A., Riasat M., Un Nisa W., Nisar A., Ahmad S. Mean value of probing depth and TM of abutment teeth in patients using removable partial denture. *Pak J Health Sci*. 2024;5(2):75–78. https://doi.org/10.54393/pjhs.v5i02.1333

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