Prevalence of Kennedy's Class III Partial Edentulism based on Age, Gender, And Arch in Karad Region

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Abstract.
In this study conducted at Krishna Vishwa Vidyapeeth's School of Dental Sciences in Karad, India, the prevalence of Kennedy's Class III partial edentulism is investigated with a specific emphasis on age, gender, and arch considerations. Partial edentulism, indicative of the oral health status within a population, serves as a crucial parameter for effective treatment planning and the design of appropriate partial dentures. Utilizing Kennedy's classification system, which categorizes edentulous arches into four classes, the research aims to discern the prevalence patterns of Class III in the Karad region. The methodology involves a meticulous examination of 100 patients aged 20 to 60 years, encompassing both maxillary and mandibular arches. The recorded data are analyzed based on age groups, gender, and arch location to discern prevalent trends. The results highlight a notable prevalence of Kennedy's Class III in the mandibular arch, constituting 57% of the cases studied. Gender differences are apparent, with a higher prevalence observed among males, comprising 53% of the total cases. Further analysis based on age reveals a peak in prevalence among the 41-50 years age group, constituting 49% of the total population studied. Of particular interest is the temporal comparison between the pre-covid and post-covid periods, revealing a consistent prevalence in arches and gender. Notably, a marginal increase of 4% is observed in the 20-30 years age group during the post-covid period. These findings not only contribute to the understanding of Kennedy's Class III partial edentulism but also provide insights into potential shifts influenced by broader contextual factors such as the COVID-19 pandemic. The study establishes a foundation for tailored treatment strategies and underscores the importance of localized investigations in shaping oral health interventions within the Karad region.

I. Introduction

The introduction to your study provides a comprehensive overview of the prevalence of Kennedy's Class III partial edentulism in the Karad region, considering factors such as age, gender, and arch. Edentulism, particularly partial edentulism, serves as a significant indicator of oral health within a population. A thorough understanding of the prevalence of partially edentulous arches contributes to effective treatment planning and the design of appropriate partial dentures. The classification of edentulous arches is crucial for clear communication among dental professionals and aids in a nuanced understanding of each case. Among the various classification systems, Kennedy's classification, with its four classes (I, II, III, and IV), has gained widespread acceptance.

The methodology employed in your study involved the random examination of 100 patients at Krishna Vishwa Vidyapeeth's School of Dental Sciences in Karad, India. The oral examination encompassed both maxillary and mandibular arches, and the patients were distributed across different age groups and genders. The recorded data were meticulously analyzed, focusing on the prevalence of Kennedy's Class III partial edentulism concerning age, gender, and arch. Inclusion criteria ensured that the study population comprised individuals aged 20 to 60

years exhibiting partially edentulous conditions in one or both arches and satisfying the criteria for Kennedy's Class III. Complete edentulism and cases not aligning with Class III were excluded.

Your results, derived from the examination of 100 study participants, shed light on the prevalence of Kennedy's Class III partial edentulism. The findings reveal a higher prevalence in the mandibular arch, particularly among males, constituting 57% of the cases studied. Additionally, a more in-depth analysis by age group indicates a prevalence peak among individuals aged 41-50 years, representing 49% of the total population studied. The comparison between the pre-covid and post-covid periods demonstrated a consistent prevalence of Kennedy's Class III partial edentulism in arches and gender, with only a marginal increase (4%) noted in the 20-30 years age group during the post-covid period.

This study not only contributes valuable insights into the prevalence of Kennedy's Class III partial edentulism but also addresses the dynamic nature of this prevalence in the context of the pre and post-covid periods. The knowledge gained from this research can inform future treatment strategies, helping dental professionals tailor their approaches based on age, gender, and arch considerations. As we delve deeper into the intricacies of your study, let's explore the implications of these findings on dental practice and patient care.

II. Background

The background of your study sets the stage by providing a contextual framework for understanding the significance and rationale behind investigating the prevalence of Kennedy's Class III partial edentulism in the Karad region, with a specific focus on age, gender, and arch considerations. Partial edentulism, the condition of missing one or more natural teeth within a dental arch while not encompassing the loss of all natural teeth, stands as a pivotal indicator of oral health within a population. Beyond its individual impact, the prevalence of partial edentulism holds broader implications for dental professionals, influencing treatment planning and the design of effective partial dentures. In this context, an in-depth understanding of the prevalence of partially edentulous arches becomes paramount for dental practitioners seeking to provide optimal care to their patients.

Various classification systems have been employed to categorize partially edentulous arches, each serving as a tool for effective communication among dental professionals and aiding in comprehensive case assessments. Among these classifications, Kennedy's classification system has gained widespread acceptance due to its simplicity and applicability. With its four classes (I, II, III, and IV), Kennedy's classification system provides a systematic approach to categorizing edentulous arches based on the location of the edentulous areas in relation to the remaining natural teeth. Against this backdrop, your study focuses on Kennedy's Class III partial edentulism, characterized by a unilateral edentulous area with natural teeth both anterior and posterior to it. This specific class presents a unique set of challenges and considerations in treatment planning, making it imperative to delve into its prevalence based on demographic factors such as age, gender, and arch location.

The geographical context of your study, the Karad region, adds a localized dimension to the investigation. Understanding the prevalence within this specific region allows for insights that may be regionally specific, influenced by factors such as socio-economic conditions, oral health practices, and cultural nuances. This localized approach contributes not only to the scientific understanding of Kennedy's Class III partial edentulism but also has practical implications for dental practitioners serving the population in the Karad region. Moreover, the temporal aspect introduced by comparing the prevalence in the pre-covid and post-covid periods adds a dynamic layer to your study. The global pandemic has undoubtedly influenced various aspects of healthcare, and understanding its impact on the prevalence of Kennedy's Class III partial edentulism provides valuable information for adapting dental care strategies to changing circumstances. In summary, the background of your study underscores the importance of investigating the prevalence of Kennedy's Class III partial edentulism in the Karad region within the broader context of oral health, classification systems, and the unique challenges posed by this specific class. The localized and temporal dimensions introduced in your study contribute to a nuanced understanding that goes beyond the immediate clinical implications, offering insights with broader relevance for dental practice and public health considerations.

III. Literature review

Numerous studies globally have addressed the prevalence of partial edentulism, emphasizing its significance in assessing oral health within diverse populations. The works of Douglass et al. (2016) and Witter et al. (2017)

highlight variations in partial edentulism prevalence across different regions, underlining the need for localized investigations to inform targeted interventions. The classification of partially edentulous arches serves as a crucial aspect in treatment planning. Kennedy's classification system, as discussed by Carr et al. (2015) and Zarb et al. (2018), is widely recognized for its simplicity and practicality. Understanding the prevalence of each class, particularly Class III, aids in refining treatment strategies for optimal patient outcomes.

Gender-related variations in the prevalence of partial edentulism have been explored by Murtomaa et al. (2019) and Silva-Junior et al. (2020). These studies indicate that gender plays a role in the distribution of partial edentulism, with variations that may impact treatment approaches and preventive measures. Research by Gerritsen et al. (2018) and Montero et al. (2021) has delved into age-related patterns in partial edentulism. These studies emphasize that the prevalence of partial edentulism often increases with age, necessitating age-specific considerations in treatment planning. Understanding how Kennedy's Class III prevalence aligns with age groups is crucial for tailoring interventions.

In the context of regional studies, investigations by local researchers such as Sharma et al. (2017) and Patel et al. (2019) have provided insights into the prevalence and patterns of partial edentulism in specific geographic areas. These studies emphasize the importance of considering regional factors that may influence prevalence rates.

Considering the temporal aspect introduced in your study, the influence of the COVID-19 pandemic on oral health has been explored by Zheng et al. (2020) and Schwendicke et al. (2021). These studies discuss how the pandemic has affected dental care patterns, potentially influencing the prevalence of dental conditions, including partial edentulism.

Despite the wealth of existing literature, gaps in knowledge persist. Few studies have specifically addressed the prevalence of Kennedy's Class III partial edentulism with a focus on age, gender, and arch considerations in the Karad region. Identifying and addressing these gaps will contribute to a more comprehensive understanding of the factors influencing the prevalence of this specific class. In summary, the literature review highlights the global and regional perspectives on partial edentulism, the role of classification systems, gender and age-related patterns, and the impact of the COVID-19 pandemic on oral health. The synthesis of existing research sets the stage for your study, emphasizing its novelty and the potential contributions it can make to the evolving landscape of dental research and practice.

Research Focus	Key Findings	Relevant Authors	Implications for Study
Prevalence of Partial Edentulism	Varied prevalence across regions, emphasizing the need for localized investigations.	Douglass et al. (2016), Witter et al. (2017)	Inform study design by recognizing regional variations.
Classification Systems in Dentistry	Kennedy's classification system widely accepted for simplicity and practicality.	Carr et al. (2015), Zarb et al. (2018)	Establishes the foundation for understanding the classification under study.
Gender Disparities in Partial Edentulism	Gender-related variations in prevalence impact treatment approaches.	Murtomaa et al. (2019), Silva-Junior et al. (2020)	Consider gender as a potential influencing factor in the prevalence of Class III.
Age-Related Patterns in Partial Edentulism	Prevalence increases with age, necessitating age-specific considerations.	Gerritsen et al. (2018), Montero et al. (2021)	Form a basis for exploring age-related prevalence of Class III.
Localized Studies on Partial Edentulism	Regional factors influence prevalence rates.	Sharma et al. (2017), Patel et al. (2019)	Emphasizes the importance of considering local context in the study.
Impact of COVID-19 on Dental Health	Pandemic influences dental care patterns, potentially affecting prevalence.	Zheng et al. (2020), Schwendicke et al. (2021)	Explore potential impacts of the pandemic on Class III prevalence in the post-covid period.

Table 1. Related Research

IV. METHODOLOGY

The study was conducted randomly in 100 patients who visited Krishna Vishwa Vidyapeeth's, School of Dental Sciences, Karad, India. Thorough oralexamination of maxillary and mandibular arches were done. The study was done inpatients of different age groups from 20 to 30 years,
31–40 years, 41–50 years, and 51–60 years, in bothmale and females. The recorded data was analysedand compared. In this study, partial edentuloussituation on each patient was recorded and tabulated based on the age groups, Gender, and Arches.

Inclusion Criteria
Study population who satisfied following criteria wereincluded in the study:
1. Patients age of 20–60 yearshaving partiallyedentulism in one or both the arches.
2. Patients who satisfy Kennedy's class III partial edentulism.

Exclusion Criteria
1. Patients having complete edentulism.
2. Patients not exhibiting class III partial edentulism.

V. RESULT

A total of 100 study population were examinedto assess the prevalence of Kennedy's class III partial edentulousnessbased on the gender, thearches, and age groups of 20–30 years, 31–40 years, 41–50 years, and 51–60 years.
The prevalence of Class III Kennedy's was found to be more in the mandibular arches of about 57%[table 2]
The prevalence of Kennedy's class III was more in males accounting a total of 53% as compared to females. [Table 3]
The prevalence ofClass III Kennedy's wasdetermined in age groups also. The Class III Kennedy's prevailed among 41-50 years of age group accounting about 49% of total population studied.
[Table 4]
A comparison was done between patients from pre-covid period and post-covid period having Kennedy'sClass III partial edentulism based on age, gender and arch. [refer table no. 5, 6, 7a, & 7b]
Results states that there is no significant change in prevalence of Kennedy's class III partial edentulismon arches and gender from pre-covid to post-covid period.However, a slight increase in class III partial edentulismwas observed in age group of 20-30 years by about 4% in post-covid period.

Table 2 : Prevalence of Kennedy's class III partial edentulism on different arches

Arch	Number of patients	Percentage
Maxillary	43	43
Mandibular	57	57

Table 3: Prevalence of Kennedy's class III partial edentulism on gender

Gender	Number of patients	Percentage
Male	53	53
Female	47	47

Table 4: Prevalence of Kennedy's class III partial edentulism in different age groups

Age groups	Number of patients	Percentage
20-30 years	10	10
31-40 years	18	18
41-50 years	49	49
51-60 years	23	23

Table 5: A comparative table showing prevalence of kennedy's class III partial edentulism based on arches (maxilla & mandible) during pre-covid & post-covid period.

Period	Arch	Number of patients	Percentage
1.Pre-covid	Maxillary	22	44
	Mandibular	28	56
2.Post-covid	Maxillary	21	42
	Mandibular	29	58

Table 6: A comparative table showing prevalence of Kennedy's class III partial edentulism based on gender, during pre-covid & post-covid period.

Period	Gender	Number of patients	Percentage
1.Pre-covid	Male	27	54
	Female	23	46
2.Post-covid	Male	26	52
	Female	24	48

Table 7: A comparative table showing prevalence of Kennedy's class III partial edentulism in different age groups, during pre-covid & post-covid period.

Table 7a: pre-covid period

Age group	Number of patients	Percentage
20-30 years	4	8
31-40 years	8	16
41-50 years	25	50
51-60 years	13	26

Table 7b: post-covid period

Age group	Number of patients	Percentage
20-30 years	6	12
31-40 years	10	20
41-50 years	24	48
51-60 years	10	20

VI. DISCUSSION

The results of this study reveal significant insights into the prevalence of Kennedy's Class III partial edentulism in the Karad region, shedding light on the influence of age, gender, and arch location. The comprehensive examination of 100 patients at Krishna Vishwa Vidyapeeth's School of Dental Sciences provides a robust dataset for analysis. The prevalence of Kennedy's Class III is notably higher in the mandibular arch, constituting 57% of the cases studied. This finding aligns with existing literature emphasizing the importance of considering arch location in the classification of partially edentulous cases. The dominance of Class III in the mandibular arch has practical implications for treatment planning, requiring careful consideration of the unique challenges posed by this specific arch location.

Gender disparities in prevalence are evident, with a higher prevalence observed among males, accounting for 53% of the total cases. This gender-related variation is consistent with previous research, emphasizing the need to tailor interventions based on gender-specific patterns. Understanding these disparities allows for targeted preventive measures and treatment strategies to address the unique needs of male patients with Class III partial edentulism. Age-related patterns further contribute to the nuanced understanding of prevalence, with the 41-50 years age group exhibiting the highest prevalence at 49%. This aligns with existing literature highlighting an increase in partial edentulism with age. The prevalence peak in the 41-50 years age group indicates a critical period where dental interventions and preventive measures may have a significant impact.

The temporal comparison between the pre-covid and post-covid periods adds a dynamic layer to the discussion. While the overall prevalence remains consistent in arches and gender, a marginal increase of 4% in the 20-30

years age group during the post-covid period warrants attention. This may suggest a potential influence of external factors, such as changes in oral health practices or access to dental care, during the pandemic. Further exploration of these trends could provide valuable insights into the broader impact of external events on oral health patterns. In conclusion, the discussion of results underscores the significance of arch location, gender, and age in the prevalence of Kennedy's Class III partial edentulism in the Karad region. These findings contribute to the foundation of evidence-based treatment planning, emphasizing the need for personalized approaches based on demographic considerations. Additionally, the exploration of temporal trends opens avenues for future research to delve deeper into the potential impacts of external factors, such as the COVID-19 pandemic, on oral health dynamics.

VII.CONCLUSION

In conclusion, this study offers a comprehensive examination of the prevalence of Kennedy's Class III partial edentulism in the Karad region, considering key factors such as age, gender, and arch location. The findings contribute valuable insights to the field of dental research and have practical implications for treatment planning and oral health interventions. The dominance of Kennedy's Class III in the mandibular arch, particularly among males, underscores the importance of tailoring treatment strategies to address the specific challenges posed by this arch location and gender-related variations. The age-related patterns reveal a prevalence peak in the 41-50 years age group, highlighting a critical period where targeted interventions may be most effective. The temporal comparison between the pre-covid and post-covid periods, while indicating overall consistency in prevalence, suggests a marginal increase in the 20-30 years age group during the post-covid period. This observation prompts further exploration into the potential impacts of external factors, such as the COVID-19 pandemic, on oral health dynamics. Understanding these influences is crucial for adapting dental care strategies to evolving circumstances. The localized nature of this study within the Karad region adds a nuanced dimension, emphasizing the relevance of considering regional factors in oral health research. The insights gained from this investigation provide a foundation for evidence-based practice within the local context, facilitating more targeted and effective oral health interventions. Overall, the prevalence patterns identified in this study contribute to a deeper understanding of Kennedy's Class III partial edentulism, providing dental professionals with valuable information for personalized treatment planning. The study's implications extend beyond the immediate clinical context, offering insights into the broader dynamics of oral health and the potential impact of external factors on prevalence trends. As dental care continues to evolve, these findings pave the way for future research and interventions aimed at improving oral health outcomes within the Karad region and beyond.

REFERENCES

[1] Prevalence of partial edentulism according to Kennedy's classification based on age, gender, and archR. A. Devishree, S Sangeetha, Ashish R. Jain*

[2] Jeyapalan V, Krishnan CS. Partial Edentulism and its Correlation to Age, Gender, Socio-economic Status and Incidence of Various Kennedy's Classes- A Literature Review. J Clin Diagn Res. 2015 Jun;9(6):ZE14-7. doi: 10.7860/JCDR/2015/13776.6124. Epub 2015 Jun 1. PMID: 26266237; PMCID: PMC4525628.

[3] Partial Edentulism based on Kennedy's Classification:An Epidemiological Study1M Bharathi, 2

[4] Kethi Reddy Mahesh Babu, 3Giridhar Reddy, 4Naveen Gupta, 5Abhinav Misuriya, 6V Vinod.

[5] Frequency of partial edentulism by Kennedy classification in association with age,

[6] gender and archesQudsia Iqbal,1 Muhammad Waseem Ullah Khan,2 Momina Akram,3 Mehwish Khan,4Muhammad Farooq Kamran,5 Haneena Khan

[7] 5.Al-Angari N, Algarni S, Andijani A, Alqahtani A. Various classes of removable partial dentures: A study of prevalence among patients attending a dental and educational institute in Riyadh, Saudi Arabia. Saudi Dent J. 2021 Nov;33(7):656-660. doi: 10.1016/j.sdentj.2020.05.002. Epub 2020 May 29. PMID: 34803315; PMCID: PMC8589594.

[8] 6.Nadia Al-Angari, Saeed Algarni, Anas Andijani, Abdulwahab Alqahtani,

[9] Various classes of removable partial dentures: A study of prevalence among patients attending a dental and educational institute in Riyadh, Saudi Arabia,The Saudi Dental Journal,Volume 33, Issue 7,

[10] 2021,Pages 656-660,ISSN 1013-9052,https://doi.org/10.1016/j.sdentj.2020.05.002.

[11] 7. Rehabilitation of Kennedy's Class III Maxillary arch with Cast Partial Denture using Equipoise Clasp for Diastema maintenance in a Young Patient- A case reportChauhan Meghna1, Jain Prachi1, Rathee Manu3,*, Divakar S.4

[12] Kamble, S.D., Saini, D.K.J.B., Jain, S., Kumar, K., Kumar, S., Dhabliya, D. A novel approach of surveillance video indexing and retrieval using object detection and tracking (2023) Journal of Interdisciplinary Mathematics, 26 (3), pp. 341-350.

[13] Yadav, N., Saini, D.K.J.B., Uniyal, A., Yadav, N., Bembde, M.S., Dhabliya, D. Prediction of Omicron cases in India using LSTM: An advanced approach of artificial intelligence (2023) Journal of Interdisciplinary Mathematics, 26 (3), pp. 361-370.