iJRASET
International Journal For Research in Applied Science and Engineering Technology

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 11 **Issue:** XI **Month of publication:** November 2023

DOI: https://doi.org/10.22214/ijraset.2023.56834

www.ijraset.com

Call: 08813907089 | E-mail ID: ijraset@gmail.com

International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 11 Issue XI Nov 2023- Available at www.ijraset.com

Effect of Dietary and Oral Hygiene Habits on Occlusal Wear - An Observational Study

Nivedha S. S[1], Oviya.P[2] Mounitha S[3], Prakash S[4], Nirmal Raj D R[5], Ranjani. T[6], Ponsekar Abraham. A[7]
[1, 2, 3, 4, 5]*Junior resident, Department of Prosthodontics, Crown and Bridge, Thai Moogambigai Dental college and Hospital, Dr. MGR Educational and Research Institute, Chennai.*
[6]*Professor, Department of Prosthodontics, Crown and Bridge, Thai Moogambigai Dental college and Hospital, Dr.MGR Educational and Research Institute, Chennai.*
[7]*Professor ,Head of the Department, Department of Prosthodontics, Crown and Bridge, Thai Moogambigai Dental college and Hospital, Dr. MGR Educational and Research Institute, Chennai.*

Abstract: Background: Occlusal wear, the gradual loss of tooth structure during mastication, is a significant concern in dental health. This observational study aimed to investigate the association between dietary habits, oral hygiene practices, and occlusal wear patterns and severity among middle-aged adults.
Methods: A diverse cohort of 50 participants aged 30 to 70 years was included in the study. Data on gender, dietary patterns (vegetarian/non-vegetarian and hard/soft diet), brushing duration, and occlusal wear assessment were collected through structured questionnaires and intra-oral examinations using the Smith and Knight Tooth wear index [1984]. Chi-square tests were applied for statistical analysis.
Results: The mean age of participants was 51 years, with a relatively balanced gender distribution (48% male, 52% female). Non-vegetarian diet (74%) and hard diet (66%) were more prevalent. On average, participants reported brushing their teeth for 5.14 minutes per session. Posterior wear (40%) was the most common pattern, and mild wear (40%) was the predominant severity. Non-vegetarians exhibited a higher prevalence of posterior wear ($p = 0.204$) and more varied occlusal wear severity compared to vegetarians. Males had slightly longer brushing duration and higher posterior wear prevalence ($p = 0.048$).
Conclusion: This study provides valuable insights into the impact of dietary and oral hygiene habits on occlusal wear among middle-aged adults. It emphasizes the importance of personalized dental care and preventive measures to manage occlusal wear effectively and promote better oral health.
Keywords: Occlusal wear, dietary habits, oral hygiene practices, middle-aged adults, brushing duration, posterior wear, dental health, preventive measures.

I. INTRODUCTION

Occlusal wear, the progressive loss of tooth structure due to mechanical forces during mastication, is a common dental concern that can significantly impact an individual's oral health and overall well-being. It can lead to functional problems, aesthetic issues, and potential discomfort.

While occlusal wear is considered a normal physiological process to some extent, excessive wear can result from various factors, including dietary habits and oral hygiene practices.[1,2] While some degree of occlusal wear is considered a normal physiological process, excessive wear can lead to functional problems, aesthetic issues, and discomfort, affecting an individual's ability to chew and speak comfortably. Additionally, severe occlusal wear can result in the need for extensive dental treatments such as crowns, bridges, or even dental implants.

Numerous factors contribute to the development and progression of occlusal wear, and research in this area has gained substantial attention among dental professionals and researchers. Among the various factors influencing occlusal wear, dietary habits and oral hygiene practices have been recognized as key determinants. The food and beverages we consume play a crucial role in the integrity of tooth surfaces. Certain dietary choices, such as the consumption of acidic, sugary, or abrasive foods, can accelerate tooth wear and increase the risk of dental erosion and attrition.[3] On the other hand, adequate oral hygiene practices, including regular brushing, flossing, and professional dental cleanings, are essential for maintaining good oral health and preventing occlusal wear. The association between diet, oral hygiene practices, and occlusal wear is complex and multifaceted.[4] However, existing literature has provided valuable insights into the potential impact of these factors on dental health.

Studies have reported that individuals following specific dietary patterns, such as vegetarians, may exhibit different wear patterns compared to non-vegetarians due to variations in food choices and textures.[5] Similarly, variations in brushing duration and technique can influence the distribution and severity of occlusal wear.

In recent years, there has been growing interest in understanding the relationship between diet, oral hygiene, and occlusal wear. Dietary habits, such as the intake of acidic and sugary foods, and oral hygiene practices, including brushing and flossing routines, are thought to play crucial roles in maintaining dental health.[6] However, the specific influence of these factors on the occurrence and severity of occlusal wear remains an area of interest for researchers and dental professionals. The present study seeks to address this gap in knowledge by conducting an observational investigation into the effect of dietary habits and oral hygiene practices on occlusal wear among a diverse adult population. By collecting data on the type of diet (vegetarian or non-vegetarian, hard or soft diet), brushing duration, and the pattern and severity of occlusal wear, we aim to identify potential associations and patterns that could inform preventive strategies and promote better oral health practices. Understanding the factors contributing to occlusal wear can have significant implications for dental care professionals, as it may lead to targeted patient education and intervention programs. By identifying modifiable risk factors, this study aims to contribute to the development of tailored recommendations that can help individuals maintain healthier dentition, prevent excessive occlusal wear, and enhance overall oral health. As such, this research serves as an essential step towards a comprehensive understanding of the multifaceted factors influencing occlusal wear. It is hoped that the findings of this study will contribute valuable insights to the field of dentistry, promoting evidence-based approaches to improve dental health outcomes and quality of life for patients.

II. MATERIALS AND METHODS

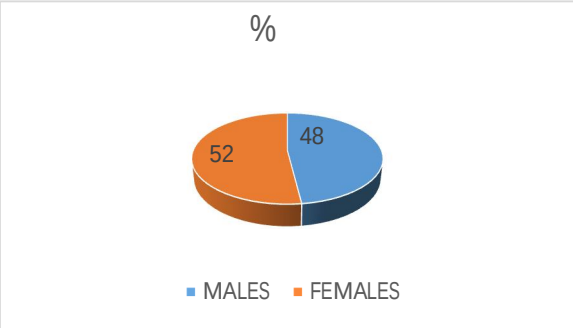
The study was conducted among the patients visiting the out-patient prosthodontics department in a private dental college, Chennai. A total of 50 adults between the ages of 30 and 70 years were a included for this study. Participants completed a structured questionnaire that included information on their name, age, gender, dietary habits (categorized as vegetarian or non-vegetarian and hard or soft diet), brushing duration, and occlusal wear assessment. The occlusal wear was further classified as anterior, posterior, or both, and categorized by severity as mild, mild to moderate, moderate, or severe. The occlusal wear assessment was done intra-orally and severity was assessed by Smith and Knight Tooth wear index [1984]. The data obtained was transferred to excel sheet, to analyse the data PSPP 3.0 software was used. To compare propionates Chi-square test was used, any p- value less than 0.005 was considered statistically significant.

III. RESULTS

The study included 50 participants, indicating a diverse representation of middle-aged adults with a mean age of 51 years. The gender distribution was relatively balanced, with 48% male (24 participants) and 52% female (26 participants) participants. In terms of dietary patterns, 26% of the participants followed a vegetarian diet (13 individuals) while 74% adhered to a non-vegetarian diet (37 individuals).Regarding the type of diet, 66% of the participants (33 out of 50) followed a hard diet, whereas 34% (17 out of 50) reported having a soft diet.

On average, participants reported brushing their teeth for approximately 5.14 minutes per session, with variations observed in brushing durations across the study group. Regarding occlusal wear patterns, the distribution revealed that 40% of participants (20 out of 50) had posterior wear, while 10% (5 out of 50) had anterior wear. Notably, 50% (25 out of 50) exhibited wear in both the anterior and posterior regions. Considering the severity of occlusal wear, the majority of participants (40%, 20 out of 50) demonstrated mild wear. Mild to moderate wear was observed in 32% of participants (16 out of 50), and moderate wear was present in 28% (14 out of 50). Additionally, 8% of participants (4 out of 50) displayed severe occlusal wear. The mean brushing duration is slightly higher for non-vegetarians (5.19 minutes) compared to vegetarians (5.11 minutes).Non-vegetarians have a higher prevalence of posterior wear, with 13 participants showing this pattern, compared to vegetarians, where only 3 participants exhibited posterior wear. The distribution of occlusal wear severity appears to be more varied among non-vegetarians, with 4 participants displaying severe wear, whereas vegetarians had only 2 participants with moderate wear and none with severe wear [p-value (0.204)]. The mean brushing duration is slightly higher for males (5.82 minutes) compared to females (4.69 minutes). There are more males with posterior wear (10 out of 17) compared to females (13 out of 42). The distribution of occlusal wear severity appears to be more varied among females, with 2 participants displaying severe wear, whereas males had 5 participants with severe wear. (P-value = 0.048)

TABLE 1: QUESTIONNAIRE
1. Patient name :
2. Patient age :
3. Gender :
4. Diet : a. Vegetarian
b. Non Vegetarian
5. Type of diet : a. Hard
b. Soft
6. Brushing duration :
7. Occlusal wear : a. Anterior
b. Posterior
c. Both
8. Severity : a. Mild
b. Mild Moderate
c. Moderate
d. Severe



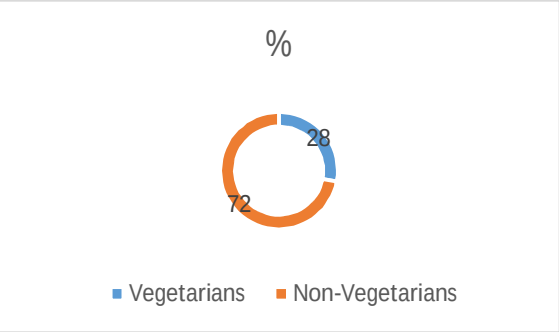


Table 2: Chi-Square Test for Occlusal Wear Severity [COMPARING MALES AND FEMALES*]*

	MALES	FEMALES	TOTAL	CHI-SQUARE	P-VALUE
MILD	3	6	9	Chi-square value is approximately 7.923, and the p-value is approximately 0.048.	
MILD-MODERATE	3	10	14		
MODERATE	6	13	19		
SEVERE	5	2	8		

	Male	Female	Total
Posterior Wear	10	13	25
Anterior Wear	0	2	4
Both Wear	7	11	21

The chi-square value is approximately 3.186, and the p-value is approximately 0.204

Table3: Occusal Wear Patterns

Occlusal wear patterns	
Anterior	10%
Posterior	40%
Both	50%

severity of occlusal wear	
mild	40%
Mild to moderate	32%
moderate	28%
severe	8%

Brushing Durations	
Vegetarians	5.11 minutes (approx)
Non-vegetarians	5.19 minutes (approx)
Males	5.82 minutes (approx)
Females	4.69 minutes (approx)

Contingency Table for Occusal Wear Patterns

	Vegetarian	Non- Vegetarian	Total
Posterior Wear	5	13	16
Anterior Wear	4	3	4
Both Wear	5	20	25
Total	14	36	50

	Vegetarian	Non-Vegetarian	Total
Mild	2	16	18
Mild-Moderate	4	10	14
Moderate	2	6	8
Severe	0	4	4
Total	12	38	50

IV. DISCUSSION

The results of the study provide valuable insights into the relationship between dietary and oral hygiene habits and occlusal wear among middle-aged adults. The diverse representation of participants in terms of age, gender, and dietary patterns enhances the generalizability of the findings to a broader population. The study sheds light on important aspects such as brushing duration, occlusal wear patterns, and occlusal wear severity, which are crucial for understanding and managing oral health. The findings indicate that the majority of participants followed a non-vegetarian diet, and a substantial proportion reported having a hard diet. These dietary habits may contribute to occlusal wear due to the nature of the food consumed. Hard diets, which involve consuming foods with a high abrasive potential, can lead to increased wear on the teeth. The study did not explore the specific types of foods consumed, but future research could investigate the impact of individual dietary components on occlusal wear. The mean brushing duration of approximately 5.14 minutes per session suggests that participants generally followed recommended guidelines for oral hygiene practices. However, variations in brushing durations indicate the need for targeted oral health education to ensure that individuals maintain adequate brushing times to prevent occlusal wear and other dental issues.[7] The distribution of occlusal wear patterns showed that posterior wear was the most common type, followed by wear in both the anterior and posterior regions. The presence of anterior wear, although less frequent, is still noteworthy as it may be related to certain dental habits or malocclusions.

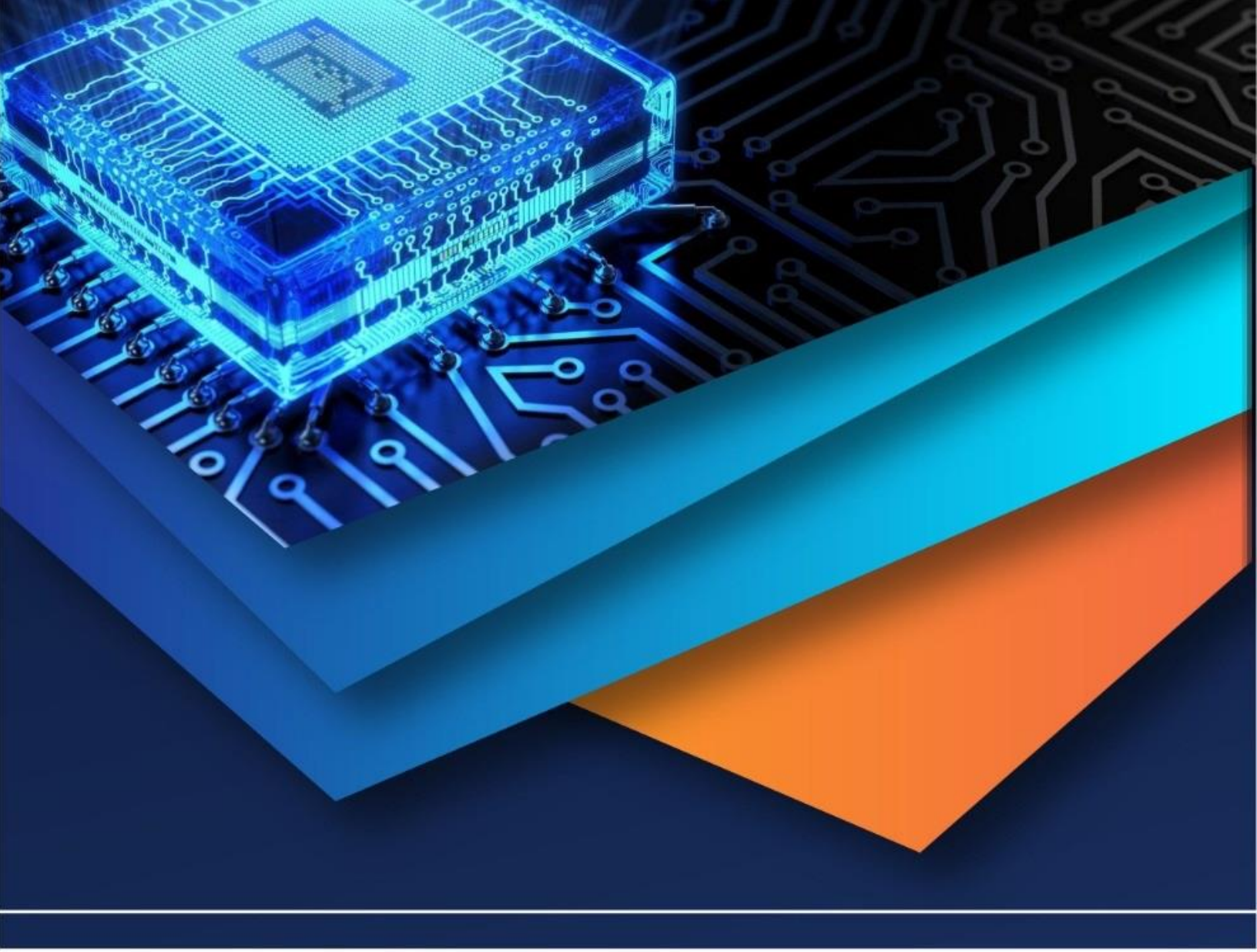
Identifying the factors contributing to anterior wear would be valuable for implementing preventive measures.[8] Occlusal wear severity was predominantly mild, with a smaller proportion displaying mild to moderate and moderate wear. The presence of severe wear in a subset of participants indicates the need for early intervention and monitoring to prevent further deterioration of occlusal surfaces. The comparison between vegetarians and non-vegetarians revealed interesting trends. Non-vegetarians had a slightly higher mean brushing duration, which might be attributed to cultural or dietary factors. Additionally, non-vegetarians had a higher prevalence of posterior wear compared to vegetarians, suggesting that dietary choices may influence the distribution of wear patterns. The significant association between dietary patterns and occlusal wear severity highlights the potential impact of diet on dental health. However, further research with a larger sample size would be beneficial to validate these findings. Furthermore, the comparison between genders revealed that males tended to have a slightly higher mean brushing duration and a higher prevalence of posterior wear which was similar with the study by Mandeep Kumar et al.[9] These differences might be influenced by individual oral hygiene habits and dietary preferences, but more comprehensive investigations are required to establish causality. Overall, the study emphasizes the importance of dental practitioners providing personalized oral health guidance based on an individual's dietary choices and oral hygiene practices.[10,11,12] Additionally, it underscores the significance of routine dental check-ups and early intervention to address occlusal wear before it reaches severe stages. However, the study has certain limitations. The sample size is relatively small, which might limit the generalizability of the findings same was in the study by Mandeep et al[13] In light of the potential for successful prevention of tooth wear progression, the importance of early diagnosis and risk assessment cannot be stressed enough. Nevertheless, the existing evidence suggests that there is significant room for enhancement in this regard.[14,15] Moreover, the data were collected using self-reported questionnaires, which may be subject to recall bias. Future studies could employ larger, more diverse samples and utilize objective measurements to strengthen the study's outcomes.

V. CONCLUSION

In conclusion, this observational study contributes to our understanding of the effect of dietary and oral hygiene habits on occlusal wear among middle-aged adults. The findings underscore the need for personalized dental care, emphasizing preventive measures and timely interventions to maintain optimal oral health and prevent the progression of occlusal wear. Further research in this area can provide valuable insights into developing targeted strategies for oral health promotion and disease prevention. These research will also significantly contributes to the decision making in choosing the right material for replacement of teeth, with prosthesis, in individuals who are prone to more wear, as a result of dietary and oral hygiene habits.

REFERENCES

[1] Shrestha D, Rajbhandari P. Prevalence and Associated Risk Factors of Tooth Wear. JNMA J Nepal Med Assoc. 2018 Jul-Aug;56(212):719-723. doi: 10.31729/jnma.3644. PMID: 30387456; PMCID: PMC8827545.
[2] Liu B, Zhang M, Chen Y, Yao Y. Tooth wear in aging people : an investigation of the prevalence and the influential factors of incisal/occlusal tooth wear in northwest China. BMC Oral Health. 2014;14:65. doi: 10.1186/1472-6831-14-65.
[3] Jerome A. Mahalick, Florian J. Knap, Elmer J. Weiter, Occlusal Wear in Prosthodontics, The Journal of the American Dental Association, Volume 82, Issue 1,1971,Pages 154-159,
[4] Okada M, Okada K, Kakehashi M. Eating habit patterns may predict maximum occlusal force: A preliminary study. PLoS One. 2022 Feb 15;17(2):e0263647. doi: 10.1371/journal.pone.0263647. PMID: 35167601; PMCID: PMC8846518.
[5] Paphangkorakit J, Kanpittaya K, Pawanja N, Pitiphat W. Effect of chewing rate on meal intake. Eur J Oral Sci. 2019;127: 40–44. doi: 10.1111/eos.12583
[6] Scudine KGO, Pedroni-Pereira A, Araujo DS, Prado DGA, Rossi AC, Castelo PM. Assessment of the differences in masticatory behavior between male and female adolescents. Physiol Behav. 2016;163: 115–122. doi: 10.1016/j.physbeh.2016.04.053
[7] Giugliano D, d'Apuzzo F, Majorana A, Campus G, Nucci F, Flores-Mir C, Perillo L. Influence of occlusal characteristics, food intake and oral hygiene habits on dental caries in adolescents: a cross-sectional study. Eur J Paediatr Dent. 2018 Jun;19(2):95-100. doi: 10.23804/ejpd.2018.19.02.02. PMID: 29790772.
[8] Thirumurthy VR, Bindhoo YA, Jacob SJ, Kurien A, Limson KS, Vidhiyasagar P. Diagnosis and management of occlusal wear: a case report. J Indian Prosthodont Soc. 2013 Sep;13(3):366-72. doi: 10.1007/s13191-012-0173-2. Epub 2012 Oct 4. PMID: 24431762; PMCID: PMC3732697.
[9] Van't Spijker A, Kreulen CM, Bronkhorst EM, Creugers NH. Occlusal wear and occlusal condition in a convenience sample of young adults. J Dent. 2015 Jan;43(1):72-7. doi: 10.1016/j.jdent.2014.11.001. Epub 2014 Nov 13. PMID: 25446239.
[10] https://opendentistryjournal.com/VOLUME/12/PAGE/735/ To Evaluate the Severity, Distribution of Occlusal Tooth Wear and its Correlation with Bite Force in Young North Indian Adults
[11] Meng M, Zhang Q, Witter DJ, Bronkhorst EM, Creugers NH, Ma C, Zhang S. Occlusal tooth wear in patients of a dental school's prosthodontic department in Xi'an, China. Int J Prosthodont. 2014 Jan-Feb;27(1):54-60. doi: 10.11607/ijp.3642. PMID: 24392478.
[12] Smith BG, Knight JK. An index for measuring the wear of teeth. Br Dent J 1984; 156(12): 435-8
[13] Kumar, Mandeep & Verma, Rashmi & Bansal, Mohit & Singh, Sunint & Rehan, Sharique & Kumar, Virender & Simran, Dr. (2018). To Evaluate the Severity, Distribution of Occlusal Tooth Wear and its Correlation with Bite Force in Young North Indian Adults. The Open Dentistry Journal. 12. 735-741. 10.2174/1745017901814010735.
[14] Mehta, S., Loomans, B., van Sambeek, R. et al. Managing tooth wear with respect to quality of life: an evidence-based decision on when to intervene. Br Dent J **234**, 455–458 (2023).
[15] Loomans B, Opdam N. A guide to managing tooth wear: the Radboud philosophy. Br Dent J 2018; **224:** 348-356.



10.22214/IJRASET

45.98

IMPACT FACTOR: 7.129

IMPACT FACTOR: 7.429

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY