

## Impact of Malocclusion and Oral Hygiene Habits on Quality of Life in Orthodontic Patients: A Cross-Sectional Study

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### Abstract.

This cross-sectional study explores the intricate interplay between malocclusion, oral hygiene habits, and the quality of life among adolescents, younger adults, and their families seeking orthodontic treatment. Ethically approved and conducted at Krishna Vishwa Vidyapeeth 'Deemed To Be University,' the study gathered responses from 100 participants, utilizing the Oral Health Impact Profile-10 (OHIP-10) questionnaire and the Index of Orthodontic Treatment Need Dental Health Component. The participants, aged between 13 and 40, provided insights into the impact of malocclusion on various facets of daily life, including mastication, speech, and psychosocial well-being. The findings reveal a diverse range of experiences, with 37% reporting problems during mastication and 40% expressing discomfort while smiling. Additionally, 24% felt uncomfortable speaking in public, highlighting the psychosocial dimensions of malocclusion. Chronic headaches were reported by 15%, and social pressure for malocclusion correction was acknowledged by 40% of participants. These results underscore the complex nature of malocclusion's impact on oral health-related quality of life. Examining oral hygiene habits, the study found that 51% of participants had oral habits in childhood, and 57% faced challenges in maintaining oral hygiene. Difficulty closing the mouth was reported by 46%, and 65% experienced difficulty pronouncing words. Notably, 59% reported clenching teeth while sleeping. These findings emphasize the need for a holistic understanding of oral health that encompasses not only physical misalignments but also functional and psychosocial aspects. In conclusion, this study contributes valuable insights to the evolving field of orthodontic research. The results emphasize the importance of personalized and patient-centered approaches in orthodontic care, addressing not only the physical aspects of malocclusion but also the functional and psychosocial dimensions that significantly impact the quality of life for orthodontic patients and their families.

**Keywords.** malocclusion, oral health-related quality of life, orthodontic treatment, oral hygiene habits, psychosocial impact, adolescents

### I. Introduction

Malocclusion, a condition characterized by improper alignment of teeth and/or jaws, has been a subject of significant interest within the field of orthodontics. Beyond its aesthetic implications, malocclusion can have profound effects on various aspects of an individual's life, influencing oral health-related quality of life (OHRQoL). This cross-sectional study aims to explore the intricate relationship between malocclusion, oral hygiene habits, and the overall quality of life in orthodontic patients, with a specific focus on adolescents, younger adults, and adults seeking orthodontic treatment.

### Background

Malocclusion is a prevalent dental condition that goes beyond mere cosmetic concerns. It encompasses a range of misalignments, such as overjet, open bite, overbite, crossbite, impeded eruption, crowding, and defects of cleft lip. These conditions not only impact the physical function of mastication but also give rise to

psychological and social challenges. The aesthetic aspects of malocclusion have long been recognized, but its broader impact on oral health-related quality of life is an evolving area of research.

The decision to conduct this study was motivated by the need to comprehensively understand how malocclusion, in conjunction with oral hygiene habits, affects the overall well-being of individuals seeking orthodontic treatment. Adolescents and adults represent a diverse demographic with varying psychosocial needs, making them an ideal population to study in order to capture a comprehensive picture of the impact of malocclusion.

### **Objectives of the Study**

The primary objective of this study is to determine the extent to which malocclusion influences oral health-related quality of life across different age groups. By employing the Oral Health Impact Profile-10 (OHIP-10) questionnaire, we aim to assess the multifaceted impact of malocclusion on various aspects of daily life, including mastication, speech, and social interactions. Additionally, the study aims to investigate the correlation between the severity of malocclusion, as assessed by the Index of Orthodontic Treatment Need dental health component, and the perceived impact on OHRQoL.

### **Methods**

The study involves a random selection of individuals aged between 13 and 40 years old from Krishna Vishwa Vidyapeeth. A cross-sectional survey using the OHIP-10 questionnaire is administered to gather insights into the participants' experiences with malocclusion. The questionnaire covers a spectrum of issues, including difficulties during mastication, discomfort while smiling or speaking in public, teeth clenching during sleep, and challenges in maintaining oral hygiene. To complement the subjective assessments, the Index of Orthodontic Treatment Need dental health component is utilized to evaluate the clinical severity of malocclusion.

### **Rationale for the Study**

Understanding the impact of malocclusion on oral health-related quality of life is pivotal for providing holistic orthodontic care. While previous research has explored the aesthetic and functional aspects of malocclusion, there is a need for a more nuanced understanding of how these factors contribute to the overall well-being of individuals. By incorporating psychological and social dimensions, this study seeks to bridge the gap between clinical orthodontics and the subjective experiences of patients.

### **Significance of the Study**

This study holds significance on multiple fronts. Firstly, it contributes to the existing body of knowledge by shedding light on the often-overlooked psychological and social implications of malocclusion. Secondly, the inclusion of different age groups allows for a comprehensive analysis, recognizing that the impact of malocclusion may vary across the lifespan. Thirdly, the integration of the Index of Orthodontic Treatment Need dental health component adds a clinical perspective, aiding orthodontic professionals in tailoring treatment plans to not only address physical misalignments but also enhance overall quality of life. The introduction sets the stage for a comprehensive exploration of the impact of malocclusion and oral hygiene habits on the quality of life in orthodontic patients. The study aims to fill gaps in current understanding, emphasizing the need for a holistic approach to orthodontic care that goes beyond the traditional focus on aesthetics and functionality. As we delve into the methodology and results, a clearer picture of the intricate relationship between malocclusion and quality of life will emerge, paving the way for improved patient-centered orthodontic interventions.

## **II. Literature Review**

Orthodontic treatment has traditionally been associated with addressing aesthetic concerns and functional misalignments. However, recent research has increasingly focused on understanding the broader implications of malocclusion on individuals' oral health-related quality of life (OHRQoL). This literature review aims to

synthesize and critically examine existing studies related to the impact of malocclusion and oral hygiene habits on the quality of life in orthodontic patients. Numerous studies have explored the functional consequences of malocclusion, emphasizing its impact on mastication, speech, and overall oral function. An investigation by Shaw et al. (2017) highlighted that malocclusion significantly contributes to difficulties in chewing and swallowing, leading to a compromised nutritional intake. This aligns with the findings of Chen et al. (2019), who reported a higher prevalence of masticatory problems in individuals with severe malocclusion. These functional challenges underscore the need for a comprehensive understanding of malocclusion beyond its cosmetic aspects.

The psychosocial dimensions of malocclusion have emerged as a focal point in recent research. A study by Zhang et al. (2020) delved into the psychological discomfort experienced by individuals with malocclusion, emphasizing the negative impact on self-esteem and social interactions. Similarly, the work of Bernabé et al. (2018) revealed a strong association between malocclusion and psychological well-being, with visible malocclusion being a significant predictor of social anxiety. These findings emphasize the importance of considering psychological factors in orthodontic treatment planning. The age-specific impact of malocclusion adds complexity to the understanding of its effects on OHRQoL. Adolescents, in particular, face unique challenges related to self-image and social acceptance. A longitudinal study by Liu et al. (2016) followed adolescents undergoing orthodontic treatment, revealing not only improvements in malocclusion but also positive changes in self-esteem and social confidence. However, the study also noted the persistence of psychosocial challenges in some individuals, suggesting the need for tailored interventions based on age and developmental stages.

Oral hygiene habits play a crucial role in the overall oral health of individuals with malocclusion. Mouth breathing, thumb sucking in childhood, and difficulty in maintaining oral hygiene due to malocclusion are factors that have been explored in the literature. A study by Wu et al. (2018) found a higher prevalence of oral hygiene challenges in individuals with severe malocclusion, emphasizing the need for targeted interventions to address these issues alongside orthodontic treatment. Assessing the clinical severity of malocclusion is essential for tailoring effective treatment plans. The Index of Orthodontic Treatment Need dental health component has been widely used in related studies. A systematic review by Al Yami et al. (2019) demonstrated a positive correlation between the severity of malocclusion and the impact on OHRQoL. This reinforces the importance of considering not only aesthetic concerns but also the clinical severity of malocclusion in treatment decisions. In conclusion, the literature review highlights the evolving landscape of research related to malocclusion and its impact on the oral health-related quality of life in orthodontic patients. The multifaceted nature of these effects, encompassing functional, psychological, and age-specific dimensions, underscores the need for a holistic approach to orthodontic care. As this study builds upon existing knowledge, it aims to contribute further insights into the complex interplay between malocclusion, oral hygiene habits, and overall quality of life.

### **III. Methods and Materials**

This study underwent ethical scrutiny and received approval from the central ethics committee at Krishna VishwaVidyapeeth 'Deemed To Be University.' Legal guardians of participating children were provided with clear instructions and signed a consent form, demonstrating their informed and voluntary agreement for their children to be part of the study. The ethical considerations and procedural details of this cross-sectional study are outlined below.

#### **Study Design:**

This investigation employed a cross-sectional study design, enrolling consecutive patients actively seeking orthodontic treatment at the Orthodontic Department of Krishna VishwaVidyapeeth. The study spanned from August 2020 to March 2022, capturing a diverse range of patients seeking orthodontic care during this period.

#### **Data Collection:**

Data collection took place during the initial orthodontic diagnosis appointments, where direct contact was established with participants. For underage patients, the presence of a legal guardian was ensured during the interaction. Prior to data collection, all participants or their legal guardians signed a well-explained and free consent form. The collected data were meticulously recorded in a purpose-designed database, ensuring each participant's confidentiality through the assignment of coded numbers.

#### **Sample Size Estimation:**

The determination of the sample size was based on the severity of malocclusion, and the calculated number of subjects required for robust statistical analysis was set at 100. Invitations were extended to students and their parents, who, after providing assent and consent respectively, became participants in the study.

#### **Questionnaire Administration:**

Participants were presented with a questionnaire that had undergone thorough validation and reliability testing by Krishna VishwaVidyapeeth. The questionnaire consisted of 10 questions addressing various aspects of malocclusion and its impact. Queries covered challenges during mastication, discomfort while speaking or smiling in public, teeth clenching during sleep, pronunciation difficulties due to malocclusion, and inquiries regarding oral hygiene habits, such as mouth breathing, thumb sucking in childhood, difficulty in maintaining oral hygiene due to malocclusion, and social disability.

#### **Oral Examination and IOTN DHC Screening:**

After completing the questionnaire, each participant underwent an oral examination. A trained and calibrated examiner conducted an Index of Orthodontic Treatment Need Dental Health Component (IOTN DHC) screening of the oral cavity. This additional step aimed to clinically assess the severity of malocclusion and align subjective reports with objective clinical findings.

The meticulous design of the study, including ethical considerations, sample size determination, and the combination of subjective questionnaire responses with clinical screenings, contributes to the robustness and comprehensiveness of the research approach. The cross-sectional nature of the study ensures a snapshot of the orthodontic patient population during the specified time frame, providing valuable insights into the impact of malocclusion on their lives.

### **IV. Result**

A total of 100 responses has been collected during the survey. When calculated the knowledge of patient facing problem during mastication, it was seen that majority of patients has no problem while mastication, out of 43/100 (43%) do not face any problem while mastication. while other 37/100 (37%) of patients face problem while mastication due to malocclusion.

Patient were asked about facing problem/uncomfortable while smiling, in which majority of them reported yes 40/100 (40%), whereas rest of them said no or sometimes 30/100 (30%) and 30/100 (30%) respectively.

Patient were asked about facing problem/uncomfortable while speaking in public due to malocclusion, in which majority of them does not feel uncomfortable while speaking in public 41/100 (41%), whereas rest of them said yes 24/100 (24%) and sometimes 35/100 (35%) feeling uncomfortable while speaking.

Patients were asked about facing any health related problems like chronic headache due to malocclusion, it was seen that majority of patients did not face any chronic headache 60/100 (60%), whereas 25/100 (25%) reported sometimes and 15/100 (15%) said no.

Among 100 majority of patient reported that they faced social pressure regarding malocclusion, that is 40/100 (40%) majority of times, 40/100 (40%) sometimes, where as 20/100 (20%) reported no such social pressure.

**Table 1. frequency of the impact of quality of life of adolescents, younger adults and their families, according to the guardians' answer ,because of malocclusion problems (n=100)**

SR. NO.	Impact of malocclusion	Knowledge (n=100)	
		Frequency	%
1	Problem while mastication		
	yes	37	37
	No	43	43
	Sometimes	20	20
2	Uncomfortable while smiling		
	yes	40	40
	No	30	30
	Sometimes	30	30
3	Uncomfortable while speaking in public.		
	yes	24	24
	No	41	41
	Sometimes	35	35
4	Causing chronic headache		
	yes	15	15
	No	60	60
	Sometimes	25	25
5	Social pressure for correcting malocclusion		
	yes	40	40
	No	20	20
	Sometimes	40	40

When patient were asked about the oral hygiene habit, they were asked about the oral habits in childhood, majority of them reported yes 51/100(51%) and 49/100(49%) reported no such oral habits.

Regarding the difficulty in maintaining oral hygiene, majority of patient faced problem, that is 57/100(57%) and rest reported to no problem that is 43/100(43%)

It was seen that majority of them had no difficulty in closing mouth, 54/100 (54%) , and remaining had difficulty in closing mouth 46/100(46%)

Regarding difficulty in pronouncing word, mostly reported that they faced difficulty 65/100(65%), whereas 35/100(35%) said that they had no such problem.

When asked about the clenching of teeth while sleeping, majority reported yes 59/100 (59%) and rest reported to have no problem 41/100 (41%).

**Table 2. frequency of the impact of quality of life of adolescents, younger adults and their families, according to the guardians' answer ,because of oral hygiene habits problems (n=100)**

SR. NO.	ORAL HYGIENE HABITS	Knowledge (n=100)	
		FREQUENCY	%
1	Oral habits in childhood		
	Yes	51	51
	No	49	49
	Sometimes	0	0
2	Difficulty in maintaining oral hygiene		
	Yes	57	57
	No	43	43
	Sometimes	0	0
3	Difficulty while closing the mouth		
	Yes	46	46
	No	54	54
	Sometimes	0	0
4	Difficulty in pronouncing words		
	Yes	65	65
	No	35	35
	Sometimes	0	0
5	Clenching of teeth while sleeping		
	Yes	59	59
	No	41	41
	Sometimes	0	0

## V. Discussion

The results of this cross-sectional study shed light on the multifaceted impact of malocclusion and oral hygiene habits on the quality of life of adolescents, younger adults, and their families. The findings provide valuable insights into the subjective experiences of patients seeking orthodontic treatment, highlighting both the physical and psychosocial aspects of malocclusion and oral hygiene challenges.

### Impact of Malocclusion on Quality of Life:

The study revealed a diverse range of impacts associated with malocclusion, influencing various aspects of daily life. The majority of participants reported no problems during mastication, indicating that a significant portion of the sample did not experience functional challenges associated with malocclusion. However, a noteworthy proportion (37%) reported difficulties, emphasizing the heterogeneity of experiences within the orthodontic patient population.

Uncomfortableness while smiling emerged as a prevalent issue, with 40% of participants affirming this impact. This aligns with existing literature emphasizing the aesthetic concerns related to malocclusion, highlighting the significance of addressing not only functional but also psychosocial aspects during orthodontic treatment.

The discomfort while speaking in public, reported by 24% of participants, underlines the psychosocial impact of malocclusion. This aspect is particularly crucial, as it delves into the interpersonal challenges faced by individuals, emphasizing the importance of considering psychological well-being in treatment planning.

The presence of chronic headaches, reported by 15% of participants, suggests a potential association between malocclusion and physical discomfort. While the percentage is relatively low, it warrants further investigation into the specific types of malocclusion and their potential links to headache symptoms.

The prevalence of social pressure for correcting malocclusion, reported by 40% of participants, indicates societal expectations and emphasizes the societal impact of dental aesthetics. These findings underscore the need for a comprehensive approach that addresses not only clinical aspects but also societal influences in orthodontic care.

### **Impact of Oral Hygiene Habits on Quality of Life:**

The study also explored the impact of oral hygiene habits on the quality of life of orthodontic patients. The majority of participants reported having oral habits in childhood (51%), highlighting the potential long-term influence of early habits on oral health. Difficulty in maintaining oral hygiene, reported by 57% of participants, underscores the practical challenges individuals face in adhering to effective oral hygiene practices.

Difficulty while closing the mouth, reported by 46%, indicates potential functional challenges associated with oral hygiene habits. This aspect may be linked to the development of habits such as mouth breathing or clenching, emphasizing the interconnectedness of oral functions.

Difficulty in pronouncing words, reported by 65%, suggests that malocclusion may have a significant impact on speech, contributing to psychosocial challenges. This aspect emphasizes the need for a comprehensive assessment of functional outcomes beyond traditional orthodontic measures.

The high prevalence of clenching of teeth while sleeping (59%) suggests a potential association between malocclusion and parafunctional habits. Addressing these habits is crucial not only for oral health but also for preventing potential complications such as temporomandibular joint disorders.

### **Limitations and Implications:**

It's essential to acknowledge the limitations of this study, including its cross-sectional nature and reliance on self-reported data. Longitudinal studies and objective clinical assessments would provide a more comprehensive understanding of the dynamic relationship between malocclusion, oral hygiene habits, and quality of life.

The implications of these findings extend to the clinical realm, emphasizing the importance of a patient-centered approach in orthodontic care. Comprehensive treatment plans should address not only the physical misalignments but also the functional and psychosocial aspects highlighted in this study. Collaborative efforts between orthodontic professionals and other healthcare providers, such as speech therapists or psychologists, may enhance the overall well-being of patients.

## **VI. Conclusion**

This cross-sectional study provides a comprehensive examination of the impact of malocclusion and oral hygiene habits on the quality of life among adolescents, younger adults, and their families seeking orthodontic treatment. The findings underscore the multifaceted nature of these influences, encompassing both physical and psychosocial dimensions. As we conclude this study, several key insights and implications come to the forefront.

### **Insights from the Study:**

**Diverse Experiences:** The study reveals a diversity of experiences among orthodontic patients, with a significant proportion reporting challenges associated with malocclusion and oral hygiene habits. This diversity highlights the need for personalized and patient-centered approaches in orthodontic care.

**Psychosocial Impact:** Beyond the physical challenges, the psychosocial impact of malocclusion is evident. Discomfort while smiling, speaking in public, and social pressure for correction underscore the importance of addressing not only clinical aspects but also the emotional and social well-being of patients.

**Oral Hygiene Challenges:** The study illuminates the oral hygiene challenges faced by individuals seeking orthodontic treatment. Difficulty in maintaining oral hygiene, difficulty in closing the mouth, and challenges in pronouncing words emphasize the need for comprehensive oral health education and support.

**Parafunctional Habits:** Clenching of teeth while sleeping, reported by a significant percentage of participants, draws attention to the potential association between malocclusion and parafunctional habits. This highlights the importance of assessing and managing such habits in orthodontic treatment.

### **Implications for Orthodontic Practice:**

**Holistic Treatment Approaches:** The findings emphasize the necessity of adopting holistic treatment approaches that consider not only the physical correction of malocclusion but also the functional, psychological, and social aspects. Orthodontic care should be tailored to address the individual needs and experiences of each patient.

**Patient Education and Support:** Recognizing the challenges in maintaining oral hygiene, orthodontic practices should prioritize patient education and support. Providing practical guidance on oral hygiene practices and addressing potential difficulties can enhance treatment outcomes and overall patient satisfaction.

**Interdisciplinary Collaboration:** The psychosocial and functional aspects highlighted in this study suggest the potential benefits of interdisciplinary collaboration. Inclusion of professionals such as psychologists, speech therapists, and oral health educators in the orthodontic team can contribute to a more comprehensive and holistic approach to patient care.

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