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RELATIONSHIP BETWEEN DENTAL AESTHETIC INDEX AND ORAL HEALTH RELATED QUALITY OF LIFE AMONG PATIENTS

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Abstract

Background: Good oral hygiene indicates good lifestyle maintenance among people. To measure oral hygiene, various indices are used. These indices set out the criteria to evaluate the abnormal conditions that deviate from the normal ones. A patient's psychosocial view is very important in the aspect of planning a treatment that would benefit them aesthetically, socially and functionally. Few patients might have severe malocclusion but least bothered about it whereas few might have mild occlusal discrepancies but tend to feel very cautious about that hindering their facial aesthetics. Perceptions of treatment modalities among patients vary from one another as few Dental aesthetic Index (DAI) covers up both the aesthetic and clinical aspects of occlusion, thus assessing the social acceptability among the population, indirectly. Since DAI has been used in conditions that do not restrict the economical and cultural perceptions among the global population, it is considered as a user friendly index. Oral Health Related Quality of Life (OHRQoL) of an individual, is assessed by Oral Health Impact Profile (OHIP-14) questionnaires that not only aids in improving malocclusion of the patient, but also enhances their psychosocial well being, for the betterment of life and society. The DAI is an appraisal or judgment in the views of a dentist, whereas the OHIP-14 is an evaluation that's purely from the patients perspective.

Aim: The main objective of this study is to analyze the relationship between DAI and OHRQoL among students.

Material and methodology: A university based setting was conducted. A sample size of 300 patients aged between 15 to 25 years of age were taken in as the study population. The OHIP-14 questionnaire consisting of 14 close ended questions was circulated to the study participants online through Google forms. The DAI index was recorded in Google forms by the surveyor of the study. The study consisted of both male and female participants aged 15 to 25 years. To eliminate bias, a randomized sampling method was employed. The data was collected over a period of 2 months. Chi square test was applied to find the association between DAI and OHRQoL.

Results: Results depicts the correlation between Dental Aesthetic index (DAI) and the Oral Health Related Quality of Life (OHIP), under definite malocclusion: 3% with never as response, 6.54% with hardly ever as response, 9.62% as occasionally, 0.38% as fairly often and 3.85% as very often. Under normal or minor malocclusion: 0.77% with never as response, 20.77% with hardly ever as response, 13.46% as occasionally, 23.46% as fairly often and 7.69% as very often. Under severe malocclusion: 8.85% as hardly ever for a response. Under very severe or handicapping malocclusion: 1.54%with hardly ever as response. (p= 0.13> 0.05; non significant)

Conclusion: This study shows that correlations between the DAI and the OHRQoL suggests that the DAI grade cannot be used to accurately predict the patients' OHRQoL

Keywords: Oral hygiene, Dental Aesthetic Index, Oral health related quality of life, relationship, psychosocial

INTRODUCTION

In the intricate tapestry of healthcare, the intersection of dental aesthetics and oral health-related quality of life (OHRQoL) has garnered increasing attention among researchers, practitioners, and educators.(Wong et al. 2007) The concept of a captivating smile extends beyond mere aesthetics; it intertwines with an

individual's overall well-being and social interactions.(Heravi et al. 2011) This research endeavors to unravel the nuanced relationship between the Dental Aesthetic Index (DAI) and Oral Health-Related Quality of Life, with a particular focus on patients and students. The Dental Aesthetic Index (DAI) is a comprehensive tool that assesses malocclusion severity and aesthetic impairment in individuals. Originating from the World Health Organization, the DAI has been instrumental in quantifying the impact of dental aesthetics on an individual's life. In parallel, Oral Health-Related Quality of Life (OHRQoL) is a multifaceted construct that encapsulates the physical, psychological, and social dimensions of oral health.(Johal et al. 2007; Traebert and Peres 2007) The amalgamation of these two dimensions prompts a compelling exploration into how malocclusion and aesthetic concerns resonate in the broader context of a person's quality of life. This research spans both clinical and academic settings, investigating the relationship between DAI and OHRQoL among diverse populations, including patients seeking dental care and students undergoing their formative years.(Klages et al. 2006; Liu et al. 2009) By examining these two cohorts, the study aims to discern potential variations in the perception and impact of malocclusion on individuals at different life stages. Beyond the functional aspects of oral health, dental aesthetics play a pivotal role in shaping an individual's self-esteem, confidence, and social interactions. An aesthetically pleasing smile is often associated with positive attributes, influencing one's perceptions and interactions within society. Therefore, understanding the intricate interplay between malocclusion and its potential influence on oral health-related quality of life is crucial for comprehensive patient care and well-rounded dental education. The existing body of literature provides a mosaic of perspectives on the relationship between dental aesthetics and quality of life. Previous studies have explored the impact of malocclusion on psychosocial well-being, social interactions, and even employment opportunities. Some research has also delved into the effectiveness of orthodontic interventions in improving not only dental aesthetics but also the overall quality of life for individuals. However, a comprehensive synthesis of these findings, especially within the context of both patients and students, is essential to derive meaningful insights. The study employs a mixed-methods approach, combining quantitative assessments through the DAI with qualitative exploration of participants' lived experiences. A diverse sample of patients seeking orthodontic treatment and students from various educational backgrounds will be recruited. Surveys, interviews, and clinical assessments will be utilized to gather comprehensive data, enabling a holistic understanding of the relationship between malocclusion and oral health-related quality of life. Unraveling the intricate relationship between the Dental Aesthetic Index and Oral Health-Related Quality of Life holds the promise of informing not only clinical practices but also educational curricula. By identifying the specific dimensions of malocclusion that significantly impact quality of life, practitioners can tailor interventions to address both functional and aesthetic concerns. Additionally, educators can integrate these findings into dental programs, fostering a more holistic approach to patient care. Acknowledging the challenges inherent in such research is imperative. Variables such as cultural differences, individual perceptions, and evolving societal standards of beauty may introduce complexities. Furthermore, the longitudinal nature of quality of life assessments poses challenges in capturing dynamic changes over time. These limitations, however, underscore the need for cautious interpretation of results and potential avenues for future research.

The research will adhere to stringent ethical guidelines, ensuring informed consent, confidentiality, and respect for participants' autonomy. Given the sensitive nature of dental aesthetics, the study will prioritize the emotional well-being of participants and implement measures to mitigate any potential psychological distress arising from discussions on self-perception and quality of life. This research embarks on a nuanced exploration of the relationship between the Dental Aesthetic Index and Oral Health-Related Quality of Life among patients and students. By delving into the intricacies of malocclusion's impact on individuals at different life stages, the study aspires to contribute valuable insights to the realms of clinical practice and dental education, fostering a more comprehensive approach to oral healthcare. Through rigorous methodology, ethical considerations, and a commitment to the holistic well-being of participants, this research endeavors to enrich our understanding of the intricate interplay between dental aesthetics and quality of life.

MATERIAL AND METHODS

Study design

A cross sectional questionnaire study

Study area

In this research endeavor, the focal point was a university environment, specifically Saveetha Dental College and Hospital, Chennai.

Study population

The population covered in this study comprises patients who are seeking orthodontic or aesthetic corrections within the age criteria of 15 - 25 years, at Saveetha dental college and hospital, Chennai.

Inclusion criteria

1. Patients who were undergoing their orthodontic or aesthetic corrections were included in this study
2. Patients who were present during the time of data scheduling were included in this study.
3. Individuals aged between 15 to 25 years of age were included in this study.

Exclusion criteria

1. Patients who were undergoing other dental options other than orthodontic or aesthetic corrections were excluded from this study
2. Patients who weren’t willing to participate in the study were excluded
3. Individuals who weren’t available at the time of survey were excluded.

Ethical clearance

1. Ethical clearance was obtained from the Institutional ethics committee of Saveetha dental college prior to the start of the study.
2. Informed written consents were obtained from the study participants
3. The participants' anonymity was maintained throughout the study period.

Scheduling

Data collection spanned a 2-month period, emphasizing both the rigor and timeliness of the study. While the study boasted validated data, its limitation stemmed from its geographic confinement to Chennai, thereby potentially limiting the generalizability of findings. To gauge oral health-related quality of life, the OHIP-14 index was employed through an online questionnaire distributed via Google Forms. Simultaneously, the DAI index, focusing on dentition and occlusion parameters, was obtained through personalized interactions between surveyors and participants. The utilization of a randomized sampling method aimed to eliminate bias, ensuring a more accurate representation of the population. Internal validity was addressed through pre-tested questionnaires, and external validity was ensured by considering potential result replication across diverse timeframes.

Sample size collection

The research cohort consisted of individuals who had undergone aesthetic or orthodontic treatments and those who hadn't. It was also segregated within a population control that includes only final year students and interns of Saveetha dental college and hospitals. A comprehensive sample of 260 participants, encompassing both genders, were selected for the study.

Survey instrument

A well structured questionnaire with close ended questions was adopted from a previously existing questionnaire of studies by (Ashari and Mohamed 2016). To establish associations between the variables of interest, particularly the Dental Aesthetic Index (DAI) and Oral Health Related Quality of Life (OHRQoL), Chi-square tests were employed. The Chi-square test is a statistical method used to determine if there is a significant association between two categorical variables. In this context, it was used to assess whether a concrete relationship exists between the DAI and OHRQoL. The results of these tests help in understanding the strength and nature of the association, providing valuable insights into the impact of dental aesthetic factors on the quality of life as perceived by the participants.

Statistical analysis

The statistical analysis involved organizing data, coding variables, utilizing frequency distribution for certain variables. Data was entered in Microsoft excel spreadsheet and SPSS was used as an analyzing tool for this study. Chi-square tests were employed to elucidate associations and establish relationships between the Dental Aesthetic Index and Oral Health Related Quality of Life. This rigorous approach ensures a robust and evidence-based interpretation of the study findings.

RESULTS:

The results of the study involved a comprehensive analysis of 260 participants, evenly split between males and females. The age distribution revealed that 23.08% fell within the 15-18 age group, a whooping 42.31% of the population in the 19-22 age group, and a considerable population of 34.62% falling under in the 23-25 age group. A significant majority (66.15%) exhibited a measure of 25mm and below, indicating normal or minor malocclusion. Meanwhile, 23.46% showed 26-30 mm of irregularity (definite malocclusion), 8.85% exhibited 30-35mm of discrepancy (severe malocclusion), and 1.54% displayed irregularities exceeding 36mm, indicating very severe or handicapping malocclusion.

Breaking down responses based on age groups, individuals aged 15-18 reported occurrences of malocclusion irregularity with a minority of 3.08% "never, a meager population of " 6.54% "hardly ever,a majority of " 9.23% "occasionally, " 0.38% "fairly often in a lesser ratio, and meager population which says 3.85% "very often." Those aged 19-22 and 23-25 showed varying percentages across these response categories.

The analysis also considered gender differences. Females reported occurrences with 2.31% of the surveyed population with "never," remaining majority of 19.23% with "hardly ever," 9.23% of the population went with "occasionally," a meager number of people with percentage of 11.54% with "fairly often," and remaining 7.69% of the surveyed group responding "very often." Males reported occurrences with 1.54% "never," a majority with 18.46% as a response with "hardly ever," second majority of the group with 13.85% responding "occasionally," third majority of 12.31% of people responding "fairly often," and minimum ratio of population of 3.85% voting "very often."as a response.

The correlation between Dental Aesthetic Index (DAI) and Oral Health Related Quality of Life (OHIP) was visually represented using an error bar graph. Under definite malocclusion, responses varied across categories, with 3% "never," 6.54% "hardly ever," 9.62% "occasionally," 0.38% "fairly often," and 3.85% "very often." For normal or minor malocclusion, responses were distributed as 0.77%, 20.77%, 13.46%, 23.46%, and 7.69% across the respective categories. Severe malocclusion and very severe or handicapping malocclusion displayed their own patterns of responses.

These detailed findings offer a nuanced understanding of the demographic distribution, malocclusion severity, and subjective experiences reported by participants, contributing valuable insights to the overarching study on the relationship between the Dental Aesthetic Index and Oral Health Related Quality of Life.

DISCUSSION:

The obtained results from our study provide valuable insights into various demographic factors and oral health conditions. The results of the study involved a comprehensive analysis of 260 participants, evenly split between males and females.

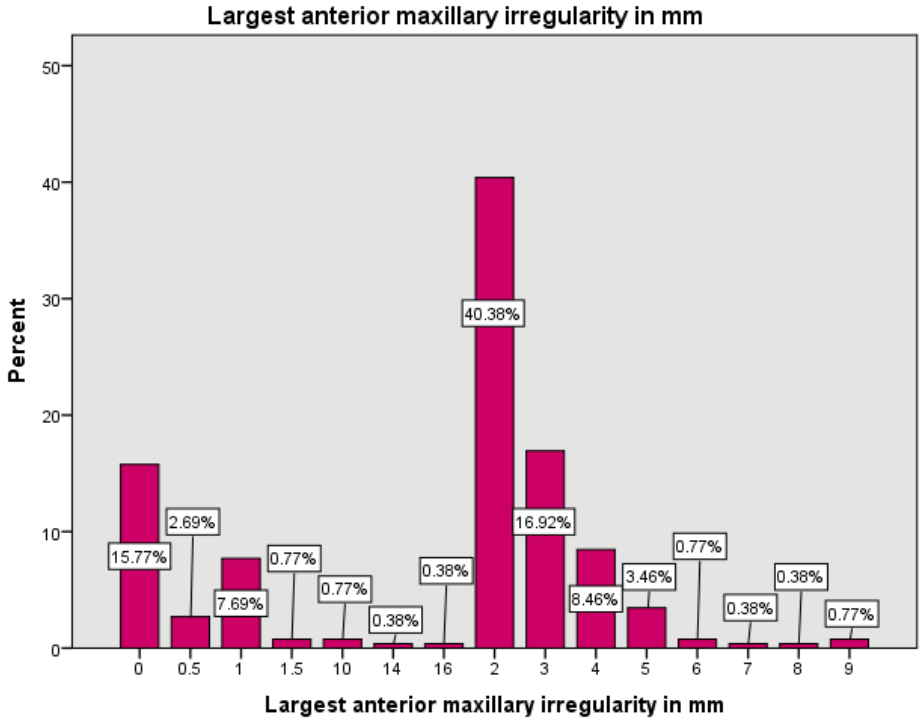
The age distribution revealed that 23.08% fell within the 15-18 age group, a whooping 42.31% of the population in the 19-22 age group, and a considerable population of 34.62% falling under in the 23-25 age group. A significant majority (66.15%) exhibited a measure of 25mm and below, indicating normal or minor malocclusion. Meanwhile, 23.46% showed 26-30 mm of irregularity (definite malocclusion), 8.85% exhibited 30-35mm of discrepancy (severe malocclusion), and 1.54% displayed irregularities exceeding 36mm, indicating very severe or handicapping malocclusion.

Notably, the most frequently encountered age group in our study is within the range of 19-22 years, constituting 42.31% of the participant population. This aligns with findings from prior research by Isiekwe et al. (2016) and R et al. (2020), which reported that 54% of individuals aged 19-22 years were the most predominant in their respective studies. The subsequent age group of 23-25 years was the next most frequently encountered, comprising 34.6% of the participants. This finding differs slightly from the studies conducted by Peres et al. (2011), Sridharan et al. (2019), and Ezhilarasan et al. (2021), who reported a frequency distribution of 32% for the same age range.

Conversely, responses based on age groups, individuals aged 15-18 reported occurrences of malocclusion irregularity with a minority of 3.08% "never, a meager population of " 6.54% "hardly ever,a majority of " 9.23% "occasionally, " 0.38% "fairly often in a lesser ratio, and meager population which says 3.85%

"very often." Those aged 19-22 and 23-25 showed varying percentages across these response categories. The least encountered age group in our study was 15-18 years, with a moderate frequency of 23.08%. While this differs slightly from the higher ratio of 24% reported in previous articles by Ezhilarasan et al. (2021) and Kamala et al. (2021), the overall age distribution in our study corresponds as per in line to patterns observed in existing literature.

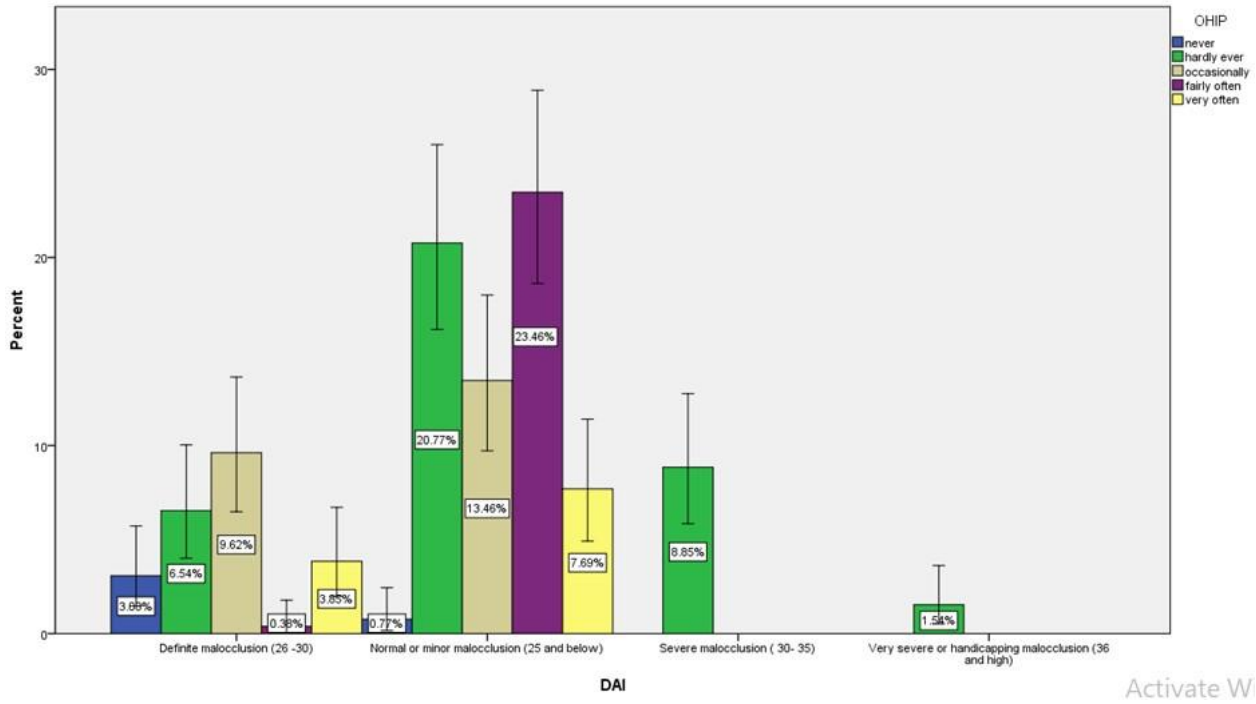
Shifting the primary focus to the Dental Aesthetic Index (DAI), our study indicates that a majority of 66.15% of the population falls under the category of normal or minor malocclusion, while a moderate ratio of 23.46% of the population denote definite malocclusion. These findings are in line with previous studies by Wong, Cheung, and McGrath (2007), Gowhari Shabgah et al. (2021), and Sekar and Auxzilia (2021). Notably, the remaining 8.85% of the population in our study exhibited severe malocclusion and a minority of 1.54% showed very severe or handicapping malocclusion. Comparisons with the study conducted by Liu, McGrath, and Hägg (2011) and Muthukrishnan (2021a) corroborate these prevalence rates.



Examining responses across age groups, our study revealed nuanced patterns in how individuals perceive their malocclusion. For instance, individuals aged 15-18 reported varying frequencies for responses such as "never," "hardly ever," "occasionally," "fairly often," and "very often." Similar patterns were observed in the following age categories of 19-22 and 23-25 years. These responses align with the findings of the study by Inglehart and Bagramian (2002) and Muthukrishnan (2021b).

Females reported occurrences with 2.31% of the surveyed population with "never," remaining majority of 19.23% with "hardly ever," 9.23% of the population went with "occasionally," a meager number of people with percentage of 11.54% with "fairly often," and remaining 7.69% of the surveyed group responding "very often." Males reported occurrences with 1.54% "never," a majority with 18.46% as a response with "hardly ever," second majority of the group with 13.85% responding "occasionally," third majority of 12.31% of people responding "fairly often," and minimum ratio of population of 3.85% voting "very often."as a response. When considering gender differences, females and males exhibited very distinct response patterns across the same categories, indicating potential variations in self-perceived oral health, individually.

Moreover, The correlation between Dental Aesthetic Index (DAI) and Oral Health Related Quality of Life (OHIP) was visually represented using an error bar graph. Under definite malocclusion, responses varied across categories, with 3% "never," 6.54% "hardly ever," 9.62% "occasionally," 0.38% "fairly often," and 3.85% "very often." For normal or minor malocclusion, responses were distributed as 0.77%, 20.77%, 13.46%, 23.46%, and 7.69% across the respective categories. Severe malocclusion and very severe or handicapping malocclusion displayed their own patterns of responses. The error graph correlation between DAI and Oral Health Related Quality of Life (OHIP) under different malocclusion categories provided some valuable additional insights. For instance, under definite malocclusion, responses ranged from "never" to "very often," demonstrating the diverse impact on the quality of life of an individual. Similar variations were observed under normal or minor malocclusion, severe malocclusion, and very severe or handicapping malocclusion. These findings align with prior studies by Klages et al. (2006), Silvola et al. (2014), and Barma et al. (2021), emphasizing the multifaceted relationship between malocclusion and oral health-related quality of life.



The error bar graph depicts the correlation between Dental Aesthetic index (DAI) and the Oral Health Related Quality of Life (OHIP). X axis represents Dental Aesthetic index (DAI) whereas Y axis denotes the frequency or percentage of the participants taken in for the study. Under definite malocclusion: blue indicates the 3% with never as response, green indicates 6.54% with hardly ever as response, brown indicates 9.62% as occasionally, purple denoting 0.38% as fairly often and yellow denotes 3.85% as very often. Under normal or minor malocclusion: blue indicates the 0.77% with never as response, green indicates 20.77% with hardly ever as response, brown indicates 13.46% as occasionally, purple denoting 23.46% as fairly often and yellow denotes 7.69% as very often. Under severe malocclusion: green denotes 8.85% as hardly ever for a response. Under very severe or handicapping malocclusion: green indicates 1.54% with hardly ever as response.

CONCLUSION:

The results of the study reveal a noteworthy insight into the impact of dental aesthetics on psychological well-being in comparison to the patients' oral, bodily, and functional well-being. It is observed that dental aesthetics exert a more substantial influence on psychological aspects than on other dimensions of well-being. Despite this, the study identifies relatively weak correlations between the Dental Aesthetic Index (DAI) and Oral Health-Related Quality of Life (OHRQoL), indicating that the DAI grade alone may not be a reliable predictor of a patient's overall OHRQoL. Consequently, it becomes apparent that a singular focus on malocclusion severity may not capture the full range of factors affecting patients' well-being.

Moreover, the study highlights a notable difference between the effects of self-perceived oral aesthetics and normatively rated oral aesthetics on young people's OHRQoL. This implies that how individuals perceive their own oral aesthetics might not perfectly align with objective, normative assessments. Such disparities underscore the subjective nature of individual experiences and emphasize the importance of incorporating patients' perspectives in orthodontic treatment planning.

The conclusion drawn from this research points towards the necessity of adopting a patient-centered approach, particularly in the evaluation of oral aesthetics and OHRQoL for orthodontic treatment planning in young individuals. Recognizing the distinct impact of dental aesthetics on psychological well-being and the nuanced relationship between subjective and objective assessments, orthodontic treatment plans should consider individual preferences, perceptions, and priorities. This emphasizes the need for a holistic and personalized approach to orthodontic care that goes beyond conventional measures of malocclusion severity and takes into account the diverse and subjective aspects of patients' experiences.

LIMITATION:

The study encountered certain limitations that warrant consideration in the interpretation of its findings. Few notable limitations pertain to the relatively limited sample size of the study population and the geographic limitations, given that it was conducted exclusively in Chennai.

To address these limitations and enhance the robustness of future research in this domain, it is recommended that prospective studies with a more extensive and diverse participant pool be conducted. Increasing the sample size and facilitating the generalizability of findings to a broader population, provide a more reliable basis for drawing conclusions and making informed decisions.

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