

**APPLICATION OF THE DENTAL AESTHETIC INDEX IN THE  
PRIORITIZATION OF ORTHODONTIC SERVICE NEEDS**

by

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## **LIST OF ABBREVIATIONS**

AAO	American Association of Orthodontists
AC	Aesthetic Component
COCSTOC	Commission on Classification and Statistics for Oral Conditions
DAI	Dental Aesthetic Index
DHC	Dental Health Component
FDI	Federation Dentaire International
HLDI	Handicapping Labio-lingual Deviation Index
HMAR	Handicapping Malocclusion Assessment Records
ICON	Index of Complexity, Outcome and Need
NOTI	Need for Orthodontic Treatment Index
OHRQoL	Oral-Health-Related Quality of Life
OI	Occlusal Index
SASO	South African Society of Orthodontists
SASOC	Social Acceptability Scale of Occlusal Conditions
SD	Standard Deviation
TPI	Treatment Priority Index
WHO	World Health Organization

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**BDS (MEDUNSA)**

**SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE  
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**DECLARATION**

I declare that the dissertation hereby submitted to the University of Limpopo, for the degree of Master of Dentistry in Orthodontics has not previously been submitted by me for a degree at this or any other university; that this is my work in design and in execution, and that all material contained herein has been dully acknowledged.

.....

P.M. Maumela (Dr)

.....

Date

## **DEDICATION**

**This research is dedicated to:**

My Mom and Dad (Mr T.N. & Mrs L. Maumela) who taught me that knowledge is the best thing that one can acquire in life.

My sisters (Ambu, Lebo, Suzan & Dakalo) who looked after my children and thus enabling this work to come to completion.

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## **PRESENTATION**

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## SUMMARY

**Introduction:** Orthodontic services in South Africa are mainly offered by the private sector and to a lesser extent by the four government funded training institutions which are plagued by limited resources. The majority of patients cannot afford private fees and seek treatment at these training institutions. The growing number of patients on waiting lists is a problem. Prioritization of orthodontic services would assist to ensure that these services are preferentially provided to those patients most likely to derive the greatest benefit.

The Dental Aesthetic Index (DAI) is used to estimate orthodontic treatment need and can also be used as a screening tool to determine treatment priority (Cons, Jenny & Kohout, 1986). The DAI focuses on aesthetics and therefore omits other malocclusion traits thereby limiting its comprehensiveness as an assessment tool. To date no published study has been found that identified other malocclusion traits not included in the DAI and examined the influence that these malocclusion traits have in the prioritization of orthodontic service needs whilst using the DAI.

Thus the aim of this research was to assess the application of the DAI to prioritize orthodontic services needs within a government funded institution. The objectives were: 1) To identify other malocclusion traits not included in the DAI. 2) To evaluate how much influence other malocclusion traits not included in DAI have in the prioritization of orthodontic service needs. 3) To compare the mean DAI scores according to age and gender.

**Materials and methods:** One hundred and twenty (120) pre-treatment study models of patients in the permanent dentition stage were collected from the records archive of the Department of Orthodontics, University of Limpopo (Medunsa campus) using a systematic sampling method. The study models were assessed using the DAI by two calibrated examiners.

Other malocclusion traits were identified and recorded according to the basic method for recording occlusal traits (Bezroukov *et al.*, 1979). Specific codes were assigned to each identified malocclusion trait from code 01 to 09. The traits were recorded once, by marking the respective code/malocclusion trait with an x when present on each study model.

Descriptive statistics, Pearson correlation coefficient, Chi-square values and t-tests were employed to analyze the data and p values of less than or equal to 0.05 ( $p \leq 0.05$ ) were considered statistical significant.

**Results:** The sample consisted of 58 females and 62 males, aged 10-45 years with a mean age of 17.9 years and a SD of 6.2 years. The DAI scores showed that 19.1% had normal or minor malocclusion, 17.5% had definitive malocclusion, 21.7% had severe malocclusion and 41.7% had handicapping malocclusion. The mean DAI score was 35.2 with a SD of 10.3. A statistical significant difference was found between mean DAI score of adults and adolescence ( $p \leq 0.05$ ), while no statistical significant difference was found between males and females ( $p \geq 0.05$ ).

The study identified the following other malocclusion traits: crowded and rotated posterior teeth (27.5%), posterior crossbite (22.8%), retained primary teeth (13.4%), missing molars (10.7%), partially erupted teeth (9.4%), deep overbite (8.1%), transposition (3.4%), peg lateral (3.4%) and supernumerary teeth (1.3%). These malocclusion traits accounted for 21.1% of the total malocclusion traits of the sample whilst the DAI accounted for 78.9%.

About 47.6% of these other malocclusion traits were found in handicapping category of the DAI, 19.5% in the severe category, 18.1% in the definitive category and 14.8% in the normal or minor category. The distribution of subjects over the four DAI categories and the distribution of subjects with other malocclusion traits over the same DAI categories did not differ significantly (Chi-square test,  $p = 0.917$ ). The intra and inter examiner reliability was tested using the Pearson correlation coefficient and found to be highly correlated ( $r = 0.9$ ).

**Conclusions:** The study showed that the DAI is a valid and reliable index that can be applied to prioritize orthodontic service needs in a financially constrained situations without any modification as two thirds of other malocclusion traits were found in categories which the DAI had already prioritized for treatment.