

„GEORGE EMIL PALADE” UNIVERSITY OF MEDICINE, PHARMACY, SCIENCE AND
TECHNOLOGY OF TÎRGU MUREŞ

SCHOOL OF DOCTORAL STUDIES

PhD THESIS

-SUMMARY-

Esthetic-functional correlations in the rehabilitation of the frontal zone of the dental arches

PhD Student: **BARDOCZ- VERES ZSUZSANNA**

Supervisor: **Prof. Dr. SORIN POPŞOR**

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UNIVERSITATEA DE MEDICINĂ,
FARMACIE, ȘTIINȚE ȘI TEHNOLOGIE
„GEORGE EMIL PALADE”
DIN TÂRGU MUREŞ

Introduction:

The maxillary frontal area is a region of maximum aesthetic interest, with a high degree of exposure. An important factor in aesthetic restorations is that the mechanical, optical and biological characteristics of the chosen materials correspond to both functional and aesthetic principles. Prosthetic restorations of this area are of primary interest in providing physiognomy, phonation, incision, and also in improving inter-human communication and structuring the individual personality.

Patients with challenging prosthodontic conditions require rehabilitation with a biological, functional, and aesthetic approach. The frontal area is the most important area of the facies aesthetically and the prosthetic restoration of this area is of primary interest in providing physiognomy, phonation, incision, improving communication and personality.

The motivation for choosing the topic was the desire to approach in a unified way a complex subject, less treated in the national and international literature. The topic chosen for the research is focused on the rehabilitation of the maxillary frontal area, placing equal emphasis on both aesthetics and functionality.

Objectives:

- Determining the prevalence of dental diseases in the maxillary frontal area and presenting a case of a complex oral rehabilitation

- Study the optical and mechanical properties of the most commonly used aesthetic restorative materials

- Evaluation of aesthetic proportions, in particularly investigating the accuracy of Chu's proportion gauge

- Evaluation of the level of knowledge of students, technicians and dentists regarding the use of dental articulators and dental facebow systems.

An important objective, as a result of concerns in daily practice, was to study subjects affected at the level of maxillary anterior area, which is aesthetically the most important. In my PhD thesis I proposed to determine the most common dental disorders of the maxillary frontal area in Mureş County, by including different genders and patients with different backgrounds and education.

Another objective of the research was to identify the functionally important components and elements of dental articulators, how they may affect the frontal area, the anterior determinant and implicitly the quality of prosthetic restorations.

The structure of the doctoral thesis:

The general part of the thesis covers the important aesthetic and functional factors, as well as the most common diseases of the maxillary frontal area and possible restorations are also presented.

The personal contributions part of the thesis includes five chapters that deal differently with the aesthetic and functional aspects of the rehabilitation of the maxillary frontal area.

Study 1: The first study aimed to investigate the optical and mechanical properties of the materials most commonly used in the reconstruction of the frontal area. The objective of the study was to evaluate, in vitro, the fluorescence intensity of composite resins with a focus on direct enamel restoration. In collaboration with the Sapientia University, a total number of 9 different brands of restorative materials used for direct enamel restorations were analyzed.

Study 2: The aim of the study was to evaluate aesthetic proportions in the maxillary frontal area and to test the validity of the tool released by Dr. Stephen Chu and verify the existence of a mathematical correlation between maxillary frontal tooth size and the 78% RED proportion. The study was carried out between July and September 2019 on a group of 73 patients who presented for prosthetic treatment in a private dental clinic in Târgu Mureş. Measurements were made on the buccal side of the teeth using a digital caliper, then with the proposed instrument. Tooth width was evaluated as the maximum mesiodistal distance at the proximal contact points, height was evaluated as the greatest distance from the cervical edge to the incisal edge along the tooth axis. Width/height ratios were calculated for maxillary front teeth. Within the limits of the study, we found that the mean sizes of natural maxillary front teeth did not replicate the 78% RED ratio applied by Chu's tool in the studied population. Chu's esthetic proportions did not show similarities to natural tooth sizes in this study group from Târgu Mureş.

Study 3: The next study refers to patients' perceptions of the implications of dental conditions on quality of life. The study included all patients aged between 18 and 35 years who visited two private practices in Mureş County. Subjects completed a questionnaire anonymously regarding their knowledge of prosthodontic treatments. The questionnaire, personally designed by the doctoral student, which took approximately 10 minutes to complete, consisted of 18 closed-ended, single and multiple choice questions, constructed in two

parts: the first part with questions about socio-demographic data and the second part with questions related to dental diseases, their effects and reasons for seeking prosthodontic treatment.

The fourth study is a clinical case of restoration of a severely compromised permanent maxillary central incisor affected during the Covid-19 pandemic.

The fifth study was a statistical study on the use of the facebow systems and semi-adaptable articulators in aesthetic oral rehabilitations. The aim of our study was to assess how widespread the use of articulators and facebow systems are in daily practice among Romanian dentists and to evaluate their advantages, disadvantages, and own experiences of the users. We tried to look for correlations between medical degrees, years of experience, specializations and information acquired about dental articulators and last but not least to identify the most common reasons for not using these instruments.

General conclusions:

In conclusion, it can be stated that today's society pays particular importance to the aesthetic aspects of the smile, which has also led to an increase of the demand for aesthetic treatments. It has been observed that dental diseases requiring prosthetic therapeutic solutions are directly related to gender, age, background, and educational and financial status. It can be observed the lack of concern about oral health status, lack of oral hygiene, and lack of information. The importance of the students' and dentists' own beliefs about the effectiveness, quality, and quantity of the information gained about the aesthetics and functionality of the frontal area is highlighted. These influence students', technicians', and clinicians' attitudes towards the importance of coordinating functionality and aesthetics, and their perception of the articulator's role in the adaptation and functional integration of prosthetic restorations. The present situation should be perceived by dentists as a challenge, and they should be encouraged to continue medical education in order to adapt to current requirements and to learn continuously in the field of frontal area rehabilitation.

Originality:

The PhD thesis deals with an interdisciplinary topic with obvious practical applications in oral rehabilitation. In this context, planning an oral rehabilitation treatment in the maxillary frontal area reflects the need for multidisciplinary collaboration between dental prosthodontics and dental technicians. The originality of the thesis lies in the fact that by evaluating the attitude of dental students and dentists toward the functionality of the frontal area and the attitude of patients toward dental diseases present in that area, an alarm raises to fight for the introduction into the university curriculum of practical training of students and counseling of patients on the importance of early detection of frontal area diseases.

On the other hand, the results are of modest help to the development of direct restorative materials. The study on the fluorescence of dental materials draws attention to the fact that fluorescence intensity decreases over time, providing new international data on the optical properties of composite resins.