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ANALYSIS OF THE RELATIONSHIP BETWEEN DENTAL OCCLUSION AND CRANIOFACIAL CONFIGURATION IN PATIENTS WITH DYSOSTOSIS SYNDROME APPLYING THE MICMAC TECHNIQUE.

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Abstract
The present investigation focuses on analyzing the intricate relationship between dental occlusion and craniofacial configuration in patients affected by various dysostosis syndromes. In this study, the MICMAC methodology was applied to identify key, determinant, autonomous, and dependent or result variables that interact in the relationship between dental occlusion and craniofacial configuration in this population. The examination focuses on a spectrum of variables, such as the type of dysostosis, and craniofacial morphology. The results reveal that the Type of Dysostosis emerges as a fundamental determinant, encapsulating the diversity of syndromes and their distinctive features. Likewise, Genetic History and Previous Treatments are identified as critical influences on the relationship between dental occlusion and craniofacial configuration. These findings suggest the need for multidisciplinary clinical approaches that consider genetic variability and prior medical interventions to optimize therapeutic outcomes and well-being in patients with dysostosis syndrome.

Keywords: malocclusion, genetics, influence of variables, MICMAC, dental occlusion.

Introduction
The relationship between dental occlusion and craniofacial configuration in patients with dysostosis syndrome has been a subject of interest and study in the field of dentistry and medical genetics (Cabanillas-Aquino, et al., 2021). Dysostosis syndromes encompass a diverse range of genetic disorders that affect craniofacial development and growth, with manifestations ranging from facial

deformities to problems with hearing and respiratory function (Schnabel, et al., 2021). These conditions, due to their complexity and diversity, pose unique challenges in terms of diagnosis, treatment, and understanding of their underlying mechanisms.

The interaction between dental occlusion and craniofacial configuration in patients with dysostosis syndrome has been a subject of investigation to better understand the clinical and genetic relationships that influence the development of these conditions and their functional implications (Jani, et al., 2020). For example, Tiwana, et al. (2022) evaluate dysostosis syndrome and treatments for skeletal deformities. Similarly, in (Aragón, et al., 2020) the dental, occlusal, and craniofacial characteristics are described, and it was found that the patients studied presented complete primary dentition with normal dental morphology, altered dental eruption, dental caries, and dental malocclusion; and in (Gunduz et al., 2007), craniofacial and upper airway structures were evaluated in patients with hypohidrotic ectodermal dysplasia. It was found that the characteristic craniofacial features of patients with this condition are class III malocclusion with maxillary retrusion, among others.

Particularly, the presence of malocclusions and their effects on masticatory function and facial aesthetics have been causes of concern in the clinical management of patients with dysostosis syndrome (Iyer, et al., 2021). Jaw malposition, tooth arrangement, and facial deformities can influence the ability to chew properly, which in turn can have a negative impact on a patient's quality of life (Heit, et al., 2022). Furthermore, interactions between genetic and environmental factors in the expression of dysostosis syndromes have raised the need to better understand how these variables influence the relationship between dental occlusion and craniofacial configuration.

The primary objective of this study is to comprehensively explore the relationship between dental occlusion and craniofacial configuration in patients with dysostosis syndrome, with a specific focus on identifying key variables that affect this relationship. Through the application of the MICMAC analysis technique (cross-impact matrix multiplication applied to classification), the aim is to identify the key, determinant, autonomous, and dependent or result variables that interact to shape the clinical characteristics observed in this population. Doing so, it seeks to provide a deeper understanding of how genetic characteristics, environmental conditions, previous treatments, and other factors influence the relationship between dental occlusion and craniofacial configuration in patients with dysostosis syndrome. With this knowledge, it is expected to lay the foundations for more personalized and effective care for these patients, optimizing the functional and aesthetic results in their clinical management.

Methodology

For this study, a methodological approach based on the MICMAC technique was used to analyze the relationship between dental occlusion and craniofacial configuration in patients diagnosed with dysostosis syndrome. The MICMAC technique is an analytical tool that allows the evaluation of the influence relationships between interdependent variables (Arcade, et al., 2014). Unlike traditional approaches, the MICMAC technique is based on the analysis of two types of matrices: the Cross Impact Matrix and the Cross Affectation Matrix. The Cross Impact Matrix identifies the direct influence of each variable on the others, while the Cross Affect Matrix reveals the indirect relationships.

To apply the MICMAC technique in the context of this study, the following process was followed: Identification of relevant variables: The key variables that affect the relationship between dental occlusion and craniofacial configuration in patients with dysostosis syndrome were determined. Construction of matrices: influence/dependency Matrices were constructed using previously collected data and the knowledge of experts in the field. Matrix Analysis: matrix calculations were performed using specialized software. This allowed to quantify the direct and indirect influence between the identified variables. Interpretation of Results: the results obtained from the cross matrices were interpreted to understand the nature and intensity of the relationships between dental occlusion and craniofacial configuration in the context of dysostosis syndrome.

The methodological approach was validated through comparisons with similar investigations and consultation with experts in the MICMAC technique. Obtaining ethical approval or collecting samples was not required as the approach was based on analysis of existing data and prior knowledge. It was recognized that the approach based on the MICMAC technique may be subject to certain limitations, such as the quality and availability of the data used to construct the matrices, as well as the possibility of omissions in the identification of relevant variables.

Results

In this section, the results obtained from the review of the literature and the application of the MICMAC technique to evaluate the relationship between dental occlusion and craniofacial configuration in patients with dysostosis syndrome are presented and analyzed. The findings are divided into subsections that address the variables of interest. In this sense, the key variables that could affect the relationship between dental occlusion and craniofacial configuration in patients with dysostosis syndrome may vary depending on the available scientific literature and the specific nature of the syndrome in question. However, the variables that were c-onsidered important for this study are described below:

Type of Dysostosis

Dysostosis syndrome encompasses varied types with unique craniofacial characteristics (D'Souza, et al., 2022). Among them, Treacher Collins Dysostosis is characterized by malformations in the jaw, cheekbones, and ears, with possible hearing problems (Ramanathan, 2021). Crouzon Dysostosis involves deformities such as exophthalmos and premature fusions of cranial bones, affecting growth (Gupta, et al., 2020). Apert's Dysostosis presents craniosynostosis and syndactyly in the extremities, influencing the craniofacial shape (Gruber & Dover, 2019). Other types include Pfeiffer Dysostosis with various subtypes, Saethre-Chotzen Dysostosis with facial and ear deformities, Nager Dysostosis with malar hypoplasia and limb involvement, Goldenhar Dysostosis with craniofacial and ocular malformations, and Cleidocranial Dysostosis centered on bones of the skull and collarbones, with features such as open fontanels and delayed dentition.

Craniofacial Morphology

The variable Craniofacial Morphology refers to the structure and shape of the bones that make up the skull and face of an individual (Andriani, et al., 2021). This variable involves the detailed evaluation of the anatomical and geometric characteristics of these regions, including the shape, size, and relative proportions of the different craniofacial components. Craniofacial morphology is of great importance in the clinical characterization of various medical conditions, including dysostosis syndromes (Morice, et al., 2020). Patients affected by dysostosis may present with unique craniofacial deformities, resulting from abnormalities in the embryonic development of surrounding bones and tissues. The variable Craniofacial Morphology considers both visible characteristics, such as facial profile, position of the eyes, nose, and mouth, as well as hidden characteristics, such as the disposition of cranial sutures and the relationship between the cranial and facial bones.

Malocclusion

The variable Malocclusion refers to irregularities in the alignment and relationship of the teeth in both dental arches, upper and lower, when closing the mouth (Ongelina & Narmada, 2019). This variable involves a detailed evaluation of the relative position of the teeth, as well as the way they articulate with each other during occlusion and chewing. Malocclusion can manifest itself in various forms, such as crowded teeth, excessively spaced teeth, crossbite, overbite, and open bite (Gill & Naini, 2013). In patients with dysostosis syndromes, malocclusion may be related to abnormalities in the development of the maxillary and mandibular bones and their impact on the disposition of the teeth (Achmad, et al., 2022). This variable is of great relevance in the clinical evaluation of patients with dysostosis syndromes since craniofacial anomalies can influence the position and alignment of the teeth.

Masticatory Function

The variable Masticatory Function refers to the capacity and effectiveness with which an individual carries out the chewing process, which involves crushing and preparing food through the action of the teeth and jaw before swallowing (Chao, 2022). This variable considers the evaluation of a patient's ability to perform chewing appropriately and functionally. In patients with dysostosis syndromes, abnormalities in craniofacial morphology and dental occlusion can influence masticatory function (Tsegga & Christensen, 2020). These abnormalities can affect the alignment of the teeth, the relationship between the dental arches, the ability to bite and crush food, and the coordination between the jaw and chewing muscles. The Masticatory Function variable is essential to understand how craniofacial and dental characteristics can affect the health and quality of life of patients.

Age and Growth

The variable Age and Growth refers to the temporal factor of an individual's life, represented by chronological age, and its progression in terms of growth and physical development (Ramos, et al., 2021). In the context of patients with dysostosis syndromes, this variable involves considering how craniofacial and dental characteristics evolve over time. Craniofacial morphology and dental alignment are dynamic and can undergo significant changes as an individual grows (Du, et al., 2021). The variable Age and Growth allows to analyze how these characteristics change during different stages of life, how bone structures develop, and how they can be affected by growth processes. Evaluating the variable Age and Growth is essential to understand the relationship between dental occlusion and craniofacial configuration in patients with dysostosis syndromes.

Genetic Background

The variable Genetic Background refers to information related to the genetic inheritance and family history of an individual (Birney, et al., 2021). In the context of patients with dysostosis syndromes, this variable involves considering the presence of inherited genetic mutations that can influence craniofacial development and dental disposition (Ladd, et al., 2020). Dysostosis syndromes often have a genetic basis, meaning they are caused by alterations in specific genes. This variable includes exploring whether there is a family history of dysostosis syndromes or other related genetic conditions. It could also address the identification of genetic inheritance patterns that may be associated with the craniofacial and dental characteristics observed in patients.

Previous Treatments

The variable Previous Treatments refers to the medical, therapeutic, or orthodontic interventions that a patient has previously received. In the context of patients with dysostosis syndromes, this variable involves considering any type of medical or dental treatment that patients have undergone before the study period (Kerr & Lodi, 2021). Patients with dysostosis syndromes may have received a variety of treatments to address the clinical manifestations of their condition. These treatments may include reconstructive surgeries, orthodontic therapies, medical interventions, and other specific therapeutic approaches. This variable considers how these interventions may have influenced craniofacial morphology, malocclusion, and other characteristics evaluated in the study (Patrícia, et al., 2021).

Presence of Additional Anomalies

The variable Presence of Additional Anomalies refers to the identification and evaluation of any other medical abnormality or clinical condition that coexists with dysostosis syndrome in the patients under study (Ward, et al., 2021). In the context of patients with dysostosis syndromes, this variable considers the presence of clinical characteristics other than those directly related to dysostosis. Patients with dysostosis syndromes can often present with abnormalities in additional body systems, such as cardiovascular, neurological, or digestive systems (Nokhsorova, et al., 2022). The variable Presence of Additional Anomalies addresses how these conditions may interact with craniofacial and dental manifestations, and how they could influence the relationship between dental occlusion and craniofacial configuration.

Environmental factors

The variable Environmental Factors refers to the external influences that surround an individual and can affect their physical development and health conditions (Wu, et al., 2021). In the context of patients with dysostosis syndrome, this variable addresses elements of the environment in which they live, such as nutrition, exposure to toxic substances, access to medical care, and other environmental factors that may interact with craniofacial and dental manifestations. Environmental factors play a significant role in the health and development of individuals and can influence how genetic characteristics are expressed (Widmann, et al., 2019). For example, adequate nutrition is essential for bone growth and tissue formation, while exposure to toxins can adversely affect craniofacial development. The variable Environmental Factors considers how these external influences could affect the relationship between dental occlusion and craniofacial configuration in patients with dysostosis syndrome.

Respiratory Function

The variable Respiratory Function refers to the ability of the respiratory system to carry out the breathing process efficiently and appropriately (Liu & Li, 2021). In the context of patients with dysostosis syndrome, this variable addresses how craniofacial abnormalities may influence the function of breathing, which involves the inhalation and exhalation of air. Anatomical features of the face and airways may be altered in patients with dysostosis syndrome, which could lead to partial or complete obstructions in the upper airways (Mao & Ye, 2021). These obstructions can affect inhalation and exhalation of air, which in turn can impact adequate oxygenation and ventilation. Assessing respiratory function is crucial to understanding how craniofacial abnormalities can influence patients' overall health. This variable can provide information about the presence of breathing difficulties, snoring, sleep apnea, or other problems related to the upper respiratory tract.

Next, Table 1 shows the variables systematically arranged for the subsequent application of the MICMAC technique. As seen, this table consists of four different columns. The first column shows the number assigned to each variable, while the second column shows the code or abbreviated name corresponding to each one. The third column shows the full name given to each variable and, finally, the fourth column provides a detailed description of each of these variables.

As an example, the first row will be analyzed, which corresponds to variable 1. In the first column of that row, the identification number of the variable is shown, and in the second column, the code or abbreviated name of the variable can be seen (referred to as TD), the third column shows the full name of the variable (referred to as Type of Dysostosis), and finally, the fourth column houses the specific description of the variable (concerning the detailed categorization of the dysostosis syndrome affecting a patient). Through this structure, the interpretation of Table 1 becomes more understandable and concise.

Table 1. Variables or factors selected for the application of the MICMAC technique

#	Code	Name	Description
1	TD	Type of Dysostosis	Specific categorization of dysostosis syndrome affecting a patient.
2	CM	Craniofacial Morphology	Shape and structure of the skull and face of an individual.
3	MO	Malocclusion	Condition in which the upper and lower teeth do not fit together correctly when closing the mouth.
4	MF	Masticatory Function	It refers to the process of chewing and crushing food with the teeth before swallowing it..
5	AG	Age and Growth	It refers to the chronological age of the patients and their stage of growth and development.
6	GB	Genetic Background	Refers to information about the genetic inheritance and family history of patients.

7	PT	Previous Treatments	It refers to any type of medical, therapeutic or orthodontic intervention that patients have previously received.
8	PAA	Presence of Additional Anomalies	Refers to the identification and evaluation of any other medical abnormality or clinical condition that is present in addition to dysostosis syndrome in patients.
9	EF	Environmental factors	It refers to the conditions and exposures of the environment in which patients live. This variable considers how elements of the environment, such as nutrition, exposure to toxins, access to medical care, and other environmental factors, might influence the relationship between dental occlusion and craniofacial configuration.
10	RF	Respiratory Function	It refers to the ability of the respiratory system to carry out the breathing process, which involves the inhalation and exhalation of air.

Source: Authors.

Once the variables were listed, a collective deliberation was carried out with the group of experts, to evaluate the influence and dependence relationships existing between each variable. This evaluation was carried out by creating a square matrix, which constitutes the stage corresponding to Phase II of the MICMAC approach. Next, Figure 1 presents the matrix that displays the connections of influence and direct dependence. This matrix is fully completed with the values resulting from the collective reflection carried out by the experts.
Next, Figure 1 shows the Matrix of direct influence/dependence, in which the values have been evaluated on a scale from 0 to 3, according to the opinion of the experts involved in the study. This figure represents the interactions of the variable TD (Type of Dysostosis) with other variables. For example, a strong connection between TD and CM (Craniofacial Morphology) stands out, illustrated by a value of three (3). Similarly, a strong relationship is observed with the variable MO (Malocclusion), also valued at three (3). In contrast, the relationships with MF (Masticatory Function), as well as with the variable AG (Age and Growth), GB (Genetic Background), and PT (Previous Treatments), are considered moderate, which is reflected in a value assignment of two (2). Finally, the relationship with the variable PAA (Presence of Additional Anomalies) is considered weak, translating into a value of one (1). In this way, a clear understanding of the Matrix of direct influence/dependence reflected in the figure is achieved.

Figure 1. Matrix of direct influence/dependence

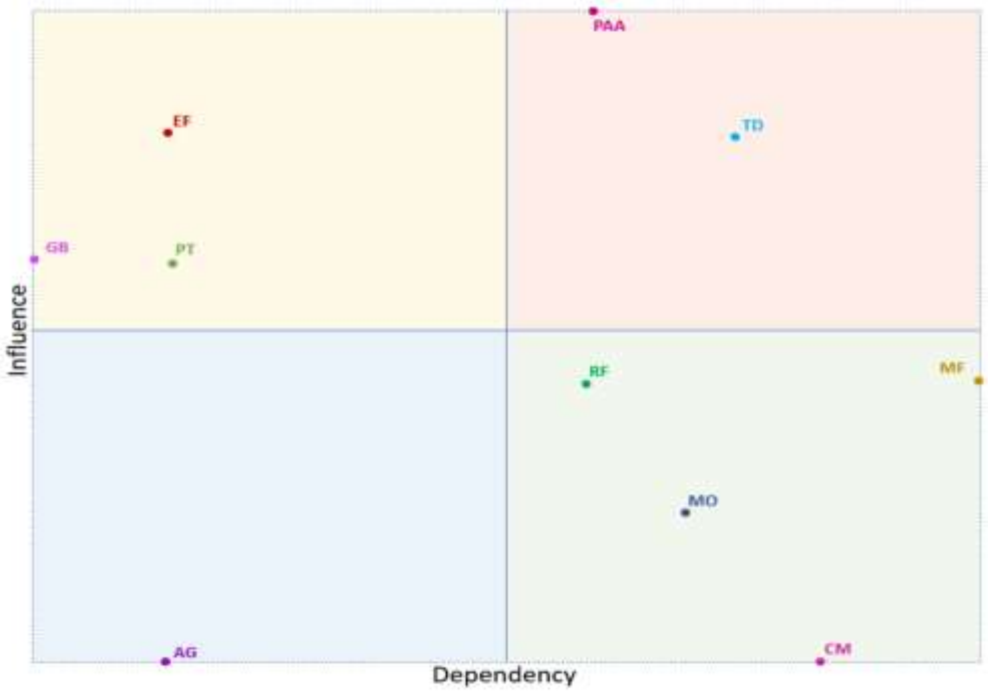
	TD	CM	MO	MF	AG	GB	PT	PAA	EF	RF
TD	0	3	3	2	2	2	2	1	2	1
CM	3	0	3	1	1	3	2	2	1	2
MO	3	3	0	1	1	2	2	0	3	2
MF	2	3	3	0	2	0	1	0	1	0
AG	3	2	2	3	0	1	0	1	0	3
GB	0	3	3	2	1	0	1	2	2	1
PT	3	1	0	1	2	2	0	2	1	2
PAA	3	0	0	1	2	2	1	0	2	1
EF	0	2	2	0	0	0	0	0	0	1
RF	2	1	1	2	1	1	2	1	1	0

Source: Authors.

After completing the Matrix of direct influence/dependence with the values that represent the relationships of each variable, the positioning and classification of each of them in the Plane of direct influence/dependence were obtained. This process is represented in a graph with four quadrants, where the key, determinant, autonomous, and result variables have been located. This graphic representation is presented in Figure 2.

The structural analysis revealed the identification of two key variables, located in the first quadrant (upper right corner). These variables are the Presence of Additional Anomalies (PAA) and the Type of Dysostosis (TD). On the other hand, in the second quadrant (upper left corner) there are three determinant variables: Environmental Factors (EF), Genetic Background (GB), and Previous Treatments (PT). One variable was classified as autonomous and is located in the third quadrant (lower left corner). This variable is Age and Growth (AG). Finally, four variables were identified as result variables and are located in the fourth quadrant (lower right corner). These variables are Respiratory Function (RF), Masticatory Function (MF), Malocclusion (MO), and Craniofacial Morphology (CM). The classification of the variables provides a clearer view of their interdependence and their role in the analysis of the relationship between dental occlusion and craniofacial configuration in patients with dysostosis syndrome.

Figure 2. Plane of direct influence/dependence



Source: Authors

Below are the results of the classification of the variables using the direct influence matrix, which are explained in detail in Table 2.

Table 2. Classification of variables by indirect influences/dependencies

Variable type	Variable	Code
Key, strategic or challenge variables	Type of Dysostosis	TD
	Presence of Additional Anomalies	PAA
Determinant or influencing variables	Genetic Background	GB
	Previous Treatments	PT
	Environmental Factors	EF
Autonomous or excluded variables	Age and Growth	AG
Dependent or result variables	Craniofacial Morphology	CM
	Malocclusion	MO
	Masticatory Function	MF
	Respiratory Function	RF

Source: Authors.

As seen in the table, the variable Type of Dysostosis has proven to be fundamental in this study after the application of the MICMAC technique, indicating its outstanding relevance in the relationship between dental occlusion and craniofacial configuration in patients with dysostosis syndrome. This result may be explained by the diversity of specific characteristics of each type of dysostosis, including unique craniofacial deformities and dental anomalies, the underlying genetic causes that influence facial and dental development, their crucial implications for the selection and effectiveness of orthodontic and therapeutic treatments, as well as the composition of the study group that may include patients with different types of syndromes.

According to Yuskiv, et al. (2020), the type of dysostosis is relevant due to its central role in determining the unique clinical characteristics present in each individual. And according to Varma, et al. (2019), each type of dysostosis is characterized by specific craniofacial deformities and patterns of malocclusion that are a direct result of the underlying genetic alterations. These genetic abnormalities influence facial bone development and dental arrangement, which in turn has a direct impact on tooth alignment, facial morphology, and masticatory function. Finally, the type of dysostosis not only provides a description of the patient's general clinical picture but also determines the direction and extent of any necessary therapeutic intervention.

Regarding the other key variable: Presence of Additional Anomalies, it suggests that this also plays a significant role in the complexity of the relationship between dental occlusion and craniofacial configuration in patients with dysostosis syndrome. This variable underscores the need for a comprehensive and personalized approach in the management of these patients, considering the interactions between clinical characteristics and additional medical conditions to achieve the best functional and aesthetic results. According to D'Souza, et al. (2022), patients with dysostosis syndromes can often present with a variety of medical conditions and abnormalities in different body systems in addition to craniofacial features. These additional anomalies may have direct or indirect effects on the relationship between dental occlusion and craniofacial configuration, affecting morphology and function.

On the other hand, the determinant variables are those that are considered highly influential factors in the variables of interest. In this study, the resulting determinant variables were: Genetic Background, Previous Treatments, and Environmental Factors.

Regarding the factor Genetic Background, it turned out to be a determinant one because it plays a crucial role in the expression and development of dysostosis syndromes, which in turn directly affects the craniofacial and dental characteristics of individuals. The genetic background highlights the fundamental importance of genetics in the relationship between dental occlusion and craniofacial configuration in patients with dysostosis syndrome. According to Urschel & Hernandez-Trujillo (2022), this variable highlights how underlying genetic mutations directly shape clinical characteristics and how understanding this genetic influence is essential for accurate evaluation and successful management of patients with these syndromes.

Regarding the factor Previous Treatments, it turned out to be determinant because previous treatments can have a direct impact on the craniofacial and dental characteristics of patients, as well as their response to future interventions. According to Tsuji, et al. (2020), this factor highlights how previous medical and orthodontic interventions have a lasting influence on the relationship between dental occlusion and craniofacial configuration in patients with dysostosis syndrome. Understanding the effects of past treatments is crucial for the interpretation of present clinical characteristics and for planning future interventions, with the aim of optimizing functional and aesthetic results in these patients.

Regarding the variable Environmental Factors, it can be said that they were determinant because this variable significantly influences the relationship between dental occlusion and craniofacial configuration in patients with dysostosis syndrome. Environmental factors can interact with patients' genetic and clinical characteristics, modeling the expression of craniofacial and dental manifestations. According to Chetty, et al. (2021), environmental factors as a determining variable underline the importance of recognizing how environmental influences can interact with genetics and affect the relationship between dental occlusion and craniofacial configuration in patients with dysostosis syndrome. This variable emphasizes the complexity of the determinants of clinical characteristics and how clinical approaches must consider genetic and environmental aspects to achieve the best treatment and health outcomes for these patients.

From another perspective, autonomous variables are those that are held constant or controlled in a study and that are used to establish comparisons. In this study, the autonomous variable was: Age and Growth, due to the decision to keep it constant or not influenced by the other variables investigated. This methodological choice was made to focus on the specific interactions and relationships between craniofacial and dental characteristics in patients with dysostosis syndrome without direct consideration of age and growth as modifying factors in this particular analysis.

On the other hand, the result variables are those that are expected to be affected by the independent or determinant variables. In this study, the result variables were: Craniofacial Morphology, Malocclusion, Masticatory Function, and Respiratory Function. In the case of Craniofacial Morphology classified as result, it may be because it is the observable and measurable product that can change due to the influence of variables such as genetic background, environmental factors, previous treatments, and others. This variable reflects how interactions between these variables directly affect the shape and configuration of craniofacial structures. In this regard, according to Ornoy (2020), genetic characteristics, environmental factors, previous treatments, and other factors can influence how craniofacial morphology develops in patients with dysostosis syndrome. These variables act as determinants that can shape facial shape and proportions.

Regarding the inclusion of the variable Malocclusion as a result variable, it suggests that this variable is influenced or affected by the other variables in the relationship between dental occlusion and craniofacial configuration in patients with dysostosis syndrome. In other words, malocclusion is the observable outcome that can change due to the influence of the independent variables in the study. According to Jaruga, et al. (2022), genetic mutations and environmental influences can contribute to the improper disposition of the teeth and mandible. Likewise, Vaahtoniemi (2020) suggests that changes in the position of the teeth and mandible can have direct effects on the way the teeth align and the jaw closes.

As for the variable Masticatory Function, it was classified as a results variable because this variable is influenced or affected by the other variables in the relationship between dental occlusion and craniofacial configuration in patients with dysostosis syndrome. In other words, the masticatory function is the observable outcome that can change due to the influence of the independent variables in the study. According to Pourahmadi-Meibodi (2020), the Masticatory function is considered an observable and measurable result of how independent variables directly affect patients' ability to perform masticatory function. And according to Severin, et al. (2021), this variable is essential to understand the functional impact of interactions between clinical characteristics in patients with dysostosis syndrome.

Finally, the inclusion of Respiratory Function as a dependent or result variable after applying the MICMAC technique suggests that this variable is influenced or affected by the other variables in the relationship between dental occlusion and craniofacial configuration in patients with dysostosis syndrome. In other words, respiratory function is the observable outcome that can change due to the influence of the independent variables in this study. According to Achmad, et al. (2022), orthodontic and surgical interventions can have an impact on respiratory function. Correcting malocclusions and alterations in craniofacial morphology can improve the airway.

Conclusions

This study on the relationship between dental occlusion and craniofacial configuration in patients with dysostosis syndrome has yielded valuable findings that contribute to the understanding of the complexity of this issue. The application of the MICMAC technique has made it possible to identify key, determinant, autonomous, and result variables that interact to model the clinical characteristics in these patients. The variable Type of Dysostosis emerges as a fundamental factor, highlighting the diversity of syndromes and their unique manifestations. Likewise, Genetic Background and Previous Treatments are revealed as significant influences on the relationship between dental occlusion and

craniofacial configuration, underlining the importance of addressing these aspects in clinical management.
However, it is crucial to address the limitations inherent to this study. The focus on previously collected data may limit the generalizability of the results. Furthermore, the exclusion of the variable Age and Growth as an influence may have restricted the consideration of an important factor in the evolution of symptoms. Despite these limitations, the findings highlight the need for interdisciplinary approaches in the management of patients with dysostosis syndrome, taking into account genetic factors, medical history, and previous treatments to optimize functional and aesthetic results. This study lays the foundation for future research that addresses these limitations and expands knowledge in this area.

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