

ORIGINAL ARTICLE

PREVALENCE OF MALOCCLUSIONS IN SCHOOLCHILDREN FROM DOLJ COUNTY, ROMANIA

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Abstract: In recent years, a significant increase in the prevalence of malocclusions has been noted globally. General, loco-regional and local factors are involved in the appearance of orthodontic pathology. Their association with cross-breeding, environmental factors and nutritional scheme contribute to worsening the clinical picture of malocclusions. *Objective.* This study aims to investigate the prevalence of malocclusions in a specific population of schoolchildren from Dolj County, Romania. *Materials and method.* The study group consisted of 216 schoolchildren aged between 6 and 14 years old, who were enrolled in two randomly selected schools from both urban and rural areas of Dolj County, Romania. *Results.* After collecting and centralizing the data, the prevalence of malocclusions was 43.98%, almost similar in urban and rural areas. *Conclusions.* Almost half of the children had malocclusions, and this underline the need for specialized treatment, but also for prevention.

Keywords: prevalence, malocclusion, schoolchildren.

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1. Introduction

Malocclusions show a continuously increasing prevalence. It has been noted that in prosperous countries the prevalence of malocclusions is much higher than in less developed countries. That is why one of the main causes is the change in diet, mainly the consumption of processed foods, during the development period of the stomatognathic system [1].

At the same time, there are disturbances in the dento-maxillary apparatus' functions (mastication, phonation, deglutition and physiognomy) and oral hygiene. Due to the fact that more and more patients require orthodontic treatment, therapeutic methods have evolved rapidly in recent years [2-4].

However, the assessment by pedodontists and orthodontists of the risks of occurrence of malocclusions in children, using modern prevention techniques, is one of the most important objectives of epidemiology in dental medicine. The identification of general (prenatal etiopathogenesis, heredity, constitutional bone diseases, phylogenetic, endocrine and dysmetabolic factors), loco-regional (dysfunctions and parafunctions) and local factors (maxillofacial trauma and tumors, scars, suppurated inflammatory lesions of the temporomandibular joint, dental caries and their complications and early tooth loss) incriminated in the etiopathogenesis of malocclusions constitutes another essential epidemiological goal [1,5]. It is necessary to promote new epidemiological research with an important role in providing useful data for establishing priorities and solving public health

problems [6-8]. Thus, quality and regular publication of research is crucial. In order to achieve these goals, dentists must play active roles by getting involved in the prevention of malocclusions.

Nowadays, malocclusions are the third most common oral health problem, after dental caries and periodontal disease, according to the World Health Organization [9-14].

The aim of the study was to investigate the prevalence of malocclusions in a specific population of schoolchildren from Dolj County, Romania.

2. Materials and method

The study was approved by the Ethics Committee of the University of Medicine and Pharmacy of Craiova, Romania (approval reference no. 56/29.01.2024), in accordance with the ethical guidelines for research with human participants of the University of Medicine and Pharmacy of Craiova, Romania. Also, the informed consent was obtained from the legal guardians of the children included in our research.

We conducted a comparative epidemiological study on the prevalence of malocclusions between two groups of schoolchildren, one from the urban area of Craiova, Romania and one from the surrounding rural areas.

The research was carried out through a partnership with two randomly selected schools from Dolj County, Romania and the related School Inspectorate. The inclusion criteria for our study was: children's age must be between 6 and 14 years old; the children

must be students of the selected schools; the informed consent must be obtained from the legal guardians of the children; the children must give their verbal consent for examination; the participation must be voluntary and the children must be cooperative. We excluded from our study: children outside the age range 6-14; children who did not receive informed consent from a legal guardian and uncooperative children.

After applying the previously mentioned criteria, our study group consisted of 216 schoolchildren.

Despite the existence of numerous classifications of malocclusions, we opted in our study for the classification of Angle, being the first to appear and the most used even today. It uses the static relation of the first permanent molars. The first permanent upper molars are assumed to have a fixed position and, thus, the mesial-distal relations that they establish with the first permanent lower molars are followed. Within this classification, there are three classes of malocclusions: Angle class I, Angle class II (with the divisions 1 and 2) and Angle class III (with the divisions 1 and 2) [15].

The data obtained were recorded electronically with the help of the software package Microsoft Excel 365 and, thus, the results could be presented through representative graphs.

3. Results

From the total number of 216 schoolchildren included in our study, 127 (58.8%) came from the urban area of Craiova,

Romania and 89 (41.2%) came from the surrounding rural areas (see Figure 1).

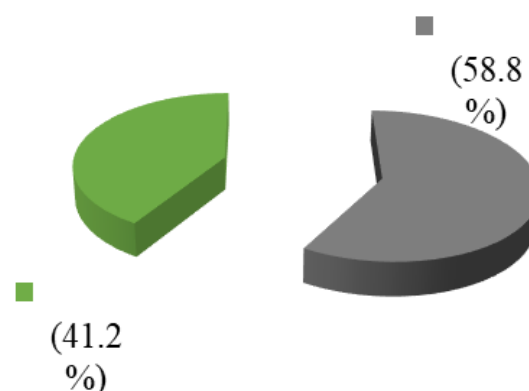


Figure 1. Schoolchildren's statistics according to the place of origin.

Among the 216 schoolchildren, 95 presented malocclusions, meaning a prevalence of 43.98% (see Figure 2).

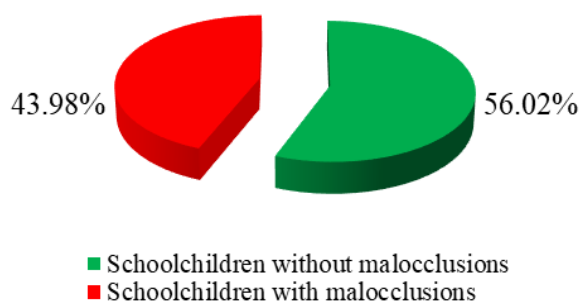


Figure 2. Statistics of schoolchildren with malocclusions.

In the urban area, out of the 127 schoolchildren, 58 presented malocclusions, so a prevalence of 45.67% (see Figure 3).

Among the 58 schoolchildren with malocclusions from the urban area: 39 (30.71%) presented Angle class I malocclusions; 13 (10.24%) presented Angle class II division 1 malocclusions; 5 (3.94%) presented Angle class II division 2

malocclusions and 1 (0.79%) presented Angle class III division 2 malocclusion (see Figure 4).

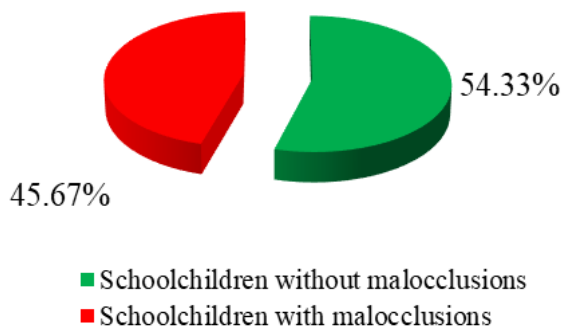


Figure 3. Statistics of schoolchildren with malocclusions from the urban area.

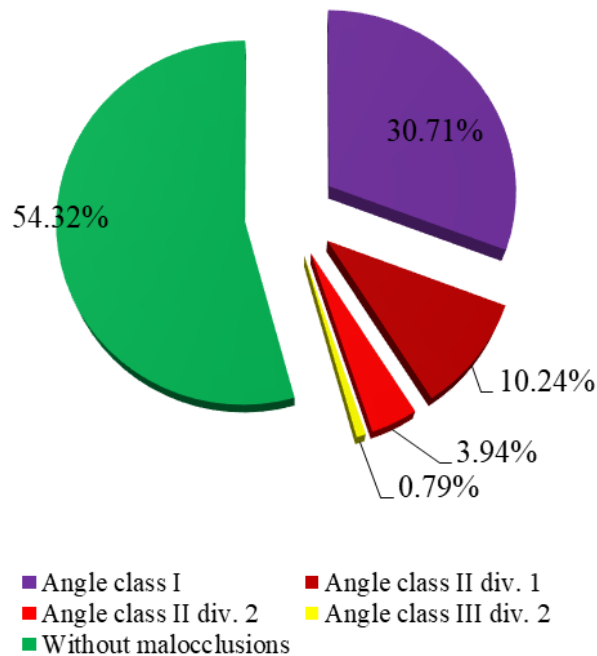


Figure 4. Statistics of schoolchildren with malocclusions from the urban area according to Angle's classification.

In the rural areas, out of the 89 schoolchildren, 37 presented malocclusions, so a prevalence of 41.57% (see Figure 5).

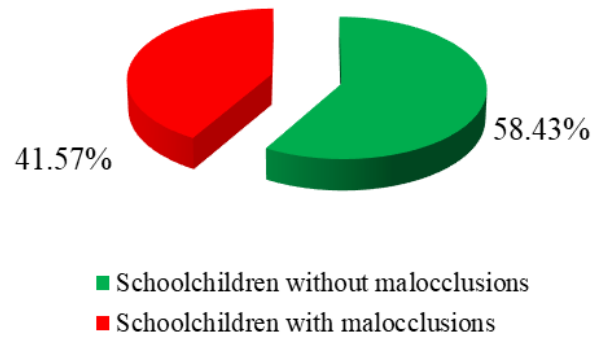


Figure 5. Statistics of schoolchildren with malocclusions from the rural areas.

Among the 37 schoolchildren with malocclusions from the rural areas: 28 (31.46%) presented Angle class I malocclusions; 8 (8.99%) presented Angle class II division 1 malocclusions and 1 (1.12%) presented Angle class II division 2 malocclusion (see Figure 6).

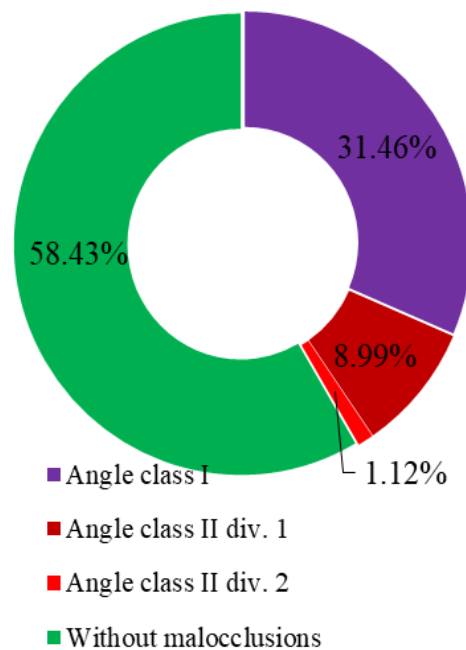


Figure 6. Statistics of schoolchildren with malocclusions from the rural areas according to Angle's classification.

4. Discussions

An epidemiological study conducted in 2001 in Romania, the researchers found the following prevalence of malocclusions: 44.7% for Angle class I; 24.6% for Angle class II and 2.3% for Angle class III [16].

After a statistical research conducted in the Dental Ambulatory for Children in Iași, Romania, covering the period from 2000 to 2010, the authors found the highest prevalence for Angle class I malocclusions (63.2%) and the lowest prevalence for Angle class III malocclusions (5.8%) [17].

It's interesting to note that another study conducted in the mining areas of the Apuseni Mountains, Romania found a similar distribution of malocclusions, but with slightly different percentages: 56.4% for Angle class I; 37.9% for Angle class II and 5.7% for Angle class III [18].

After a statistical analysis performed in Bucharest, Romania, the distribution of malocclusions was as follows: 60% for Angle class II; 28.6% for Angle class I and 11.5% for Angle class III [19]. This data shows a different prevalence pattern compared to the previous studies. This information shows that the prevalence of malocclusions can vary across different populations and regions. Factors such as genetics, environmental influences and cultural habits can contribute to these variations.

Angle class I malocclusions are the most prevalent overall, with a wide range observed in different countries, from 31% in Belgium to 96.6% in Nigeria. The distribution pattern indicates a higher prevalence among Africans

(89.44%) compared to Caucasians (71.61%) and Asians (74.87%). Additionally, Angle class I malocclusions in Asians increase during puberty, suggesting that there are developmental factors influencing the occurrence of malocclusions in this population during specific life stages [1].

Angle class II malocclusions have an overall prevalence of 19.56%, with a considerable range of variation across different countries, from 1.6% in Nigeria to 63% in Belgium. Caucasians have the highest reported prevalence at 22.9%, followed by Asians at 14.14% and Africans at 6.76%. The global distribution pattern of Angle class II malocclusions according to race is somewhat similar in the two sets of teeth. Particularly in the transition from mixed to permanent dentition, there is a tendency for correction of Angle class II malocclusions during pubertal growth, with the exception of Africans. Both the prevalence and correction of Angle class II malocclusions, as a result of pubertal growth, can be attributed to genetic influence. Recent research emphasizes the basic role of genetic control in the growth of condylar cartilage and condyles [1].

The data indicates that the overall prevalence of Angle class III malocclusions is relatively low at 5.93%, with varying percentages across different countries, ranging from 0.7% in Israel to 19.9% in China. The reported prevalence for Caucasians is 5.92%, for Africans 3.8% and for Asians 9.63%. The model of global distribution of Angle class III malocclusions seems to be consistent across both mixed and permanent dentitions. Notably,

there is a tendency for the development of Angle class III malocclusions to increase during the transition from mixed to permanent dentition in Africans and Caucasians. The importance on the genetic factor in the etiology of Angle class III malocclusions is significant. These malocclusions in Asians are primarily due to developmental deficiencies in the middle third of the face rather than mandibular prognathism [1].

5. Conclusions

Almost half of the children had malocclusions, and this underline the need for

specialized treatment, but also for prevention. Understanding the prevalence and characteristics of different malocclusions is crucial for orthodontic diagnosis and treatment planning. It also highlights the multifactorial nature of these conditions, involving multiple factors, such as genetic and developmental factors. Also, addressing the ever-increasing prevalence of malocclusions through prevention programs in collaboration with public health institutions, schools and school medical offices is a proactive approach to promote oral health.

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Author contributions

All authors read and approved the final manuscript. All authors have equally contributed to this work.

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Conflict of interest statement

The authors declare no conflicts of interest concerning this study.

Data availability statement

Will be provided on request.

Ethics statement

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