REVIEW PAPER

DOI: https://doi.org/10.20883/jms.2018.153

Analysis of the prevalence of dental and occlusal anomalies in children and adolescents in Poland and elsewhere – review of the publications from the last 10 years

Dorota Cudziło[1], Agnieszka Sikorska[2], Maja Matthews-Kozanecka[3], Teresa Matthews-Brzozowska[2]

[1] Department of Orthopedics and Orthodontics, Institute of Mother and Child in Warsaw, Poland
[2] Department of Orthopedics and Orthodontics, Poznan University of Medical Sciences, Poland
[3] Department of Social Sciences, Poznan University of Medical Sciences, Poland

ABSTRACT

Introduction. Dental and occlusal anomalies constitute a very common disorder of the mastication organ.
Aim. The objective of this work was to analyse papers published over the last decade on the prevalence of the mastication irregularities in Poland and elsewhere.
Material and Methods. The work analyses 22 publications, i.e. 6 papers on disorders in children and adolescents in Poland and 16 papers discussing such abnormalities elsewhere.
Results. Prevalence of malocclusion in the population of children and adolescents in Poland fluctuates between 52.5% and 88%, depending on the region. As regards scientific works published abroad, malocclusion oscillates between 33% and 95.6%, depending on the country.
Conclusions. Occlusal defects are diagnosed in children and adolescents both in Poland and elsewhere and the prevalence of the mastication anomalies depends neither on race nor on ethnic origin.

Keywords: dental and occlusal anomalies, mastication organ disorders, children, adolescents.

Introduction

The outcomes of numerous studies conducted in Poland and abroad show unanimously that dental and occlusal irregularities are a very common disorder of the mastication organ. The mastication organ, also called the stomatognathic system, constitutes a morphological and functional system in which the morphological elements of the craniofacial area, controlled by the central nervous system, participate in numerous functions, such as: mastication, preliminary digestion, swallowing, breathing, articulation of sounds and expression of the emotional sphere. Negative factors affecting the development of the mastication organ may result in mastication anomalies.

Aim

The objective of this work is to analyse the papers published over the last decade on the prevalence of the mastication irregularities in Poland and elsewhere.

Material and Methods

The analysis covered the publications available in Polish and foreign medical data bases. Finally,

6 papers discussing the prevalence of dental and occlusal defects in children and adolescents in Poland (**Table 1**) and 16 works on such disorders in children and adolescents abroad, were selected (**Table 2**).

Results

In the *małopolskie* province, a group of 190 ten-year-olds was examined. Malocclusion was identified in 88% of the subjects, of which distocclusion accounted for 25.8% [1]. In a group of 9–11-year-olds, composed of 128 subjects from the region of Lublin, dental and occlusal irregularities were diagnosed in 59.4% [2]. In the *zachodnio-pomorskie* province, the assessment of the occlusion in 12-year-olds revealed malocclusion in 56.6% of the subjects [3]. In the same year, a group of 600 subjects aged 13–15, was examined in Białystok. **Every age group comprised 200 subjects. Malocclusion was diagnosed in 64.5% of the 13-year-olds, 67.5% of the**

Table 1. Prevalence of dental and occlusal anomalies in children and adolescents in Poland based on selected literature

Nr	Year	Authors	Voivodeship	Number of subjects	Age in years	Malocclusions in %
1	2007	Ziemiańska-Maczek	małopolskie	190	10	88%
2	2009	Warsz et al.	małopolskie	128	9–11	59,4%
3	2009	Rojek et al.	pomorskie	120	12	56,6%
4	2009	Grodzka et al.	podlaskie	200	13	64,5%
				200	14	67,5%
				200	15	66,5%
5	2012	Kozanecka et al.	śląskie	1871	7–18	52,5%
6	2014	Osmólska-Bogucka et al.		100	9–12	82%

Table 2. Prevalence of dental and occlusal anomalies in children and adolescents worldwide based on selected literature

Nr	Year	Authors	Country	Number of subjects	Age in years	% of malocclusions
1	2007	Marques et al.	Brasil	600	13–15	47,3%
2	2007	Gelgör et al.	Turkey	2329	12–17	65,2%
3	2009	Martins et al.	Brasil	264	10–12	50% increased overjet 47,7% classe I maloc 36,7% increased overbite 22,3% classe II maloc
4	2009	Sidlauskas et al.	Lithuania	1681	7–15	84,6%
5	2012	Bourzgui et al.	Maroko	1000	8–12	84,2%
6	2013	Bugaighis et al.	Libya	343	12–17	95,6%
7	2013	Kumar et al.	India	1200	10–15	53,7%
8	2013	Lagana et al.	Albania	2617	7–15	40,4% classe I maloc 29,2% classe II maloc
9	2013	Reddy et al.	India	2135	6–12	48,30% classe I maloc 13,9% classe II maloc 11,8% stłoczenia
10	2014	Akinis et al.	Nigeria	620	13–20	80,3% classe I maloc 6,3% classe II maloc
11	2014	Al- Zubair	Jemen	3003	12	36,6%
12	2014	Nguyen et al.	Vietnam	400	12 and 18	67% classe I maloc 36,3% increased overjet 26,3% increased overbite
13	2014	Kumar et al .	India	985	6–13	33%
14	2014	Perillo et al.	Italy	516	13	% no data, the most frequent cross-bite and dental crowding
15	2015	Hanna et al.	Lebanon	655	6–11	75% classe I maloc 20% classe II maloc
16	2015	Feldens et al.	Brazil	704	12–13	69,6%

14-year-olds and 66.5% of the 15-year-olds. Distocclusion accounted for 51.4% and dental anomalies for 39.4% of all of the subjects [4]. In the group of 1,871 of children and adolescents from the Silesia region, aged 7–18, malocclusion was identified in 52.5%. The most common defect was distocclusion [5]. In the group aged 9–12, malocclusion was detected in 82%, the most common defects being: crossbite (39%) and distocclusion (37.7%), whereas dental abnormalities accounted for 70.7% [6].

The results of the research worldwide show that the mastication anomalies are a common irregularity and affect entire populations. Prevalence of dental and occlusal anomalies does not depend on ethnic origin or social and economic situation.

In Brazil, a group of 600 children aged 13–15 was examined. Dental irregularities were identified in 47.3% of the subjects [7]. In the group aged 10–12 (264 subjects), class I defects were diagnosed in 47.7%, increased overjet in 50% and increased overbite in 36.7%, whereas class II defect, i.e. distocclusion, in 22.3%. Dental defects were observed in 62.5% [8]. In the southern Brazil, a group of 704 teenagers was examined, of which 69.6% had mastication problems, unsatisfactory aesthetics of the dentition, increased overjet and dental irregularities in the upper dental arch [9].

Studies on the prevalence of dental anomalies among the populations of the Middle East have indicated that in Turkey, in a group of 2,329 children aged 12.5–17.4, the most common irregularity was malocclusion class II division 1, with increased overjet and overbite (i.e. from the group of distocclusion defects) and the dental anomalies in the anterior section were identified in 62.5% of the population [10].

In Yemen, the need for orthodontic treatment was assessed in a group of 3,003 12-year-olds – 36.6% of them were found to require such a therapy. Anomalies in the anterior sections of the mandible and maxilla were identified in 33.3% of the cases [11]. In Lebanon, a group of 655 pupils, aged 6–11, was examined. Class I defects were diagnosed in ca. 75%, class II defects in 20% [12].

The research conducted in Africa revealed the most common to be class I defects, increased overjet and overbite. The prevalence of malocclusion and the need for orthodontic treatment was assessed in the Moroccan children aged 8–12. The research comprised 1,000 school children. Malocclusion class I was observed in 61.4%, whereas class II defects were diagnosed in 24%. Overjet of 1–4mm was confirmed in 63.8% cases and increased overbite was identified in 23.6% of the subjects. 84.2% of the children required orthodontic treatment [13].

In Libya, the study covered 343 children aged 12–17. Malocclusion was diagnosed in 95.6% of the subjects: class I defects were found in 66.5%, class II in 25.4%, dental anomalies in the upper dental arch were detected in 13.9%, whereas the lower arch defects accounted for 12.2% [14]. Among 620 Nigerian teenagers, aged 13–20, class I defect was diagnosed in 80.3%, class II in 6.3% and dental anomalies in the upper arch in 14.4% [15].

Other studies on dental abnormalities conducted in Europe demonstrated a high percentage of occlusal anomalies. Of 1,681 Lithuanian pupils, studied in three age groups (7–9, 10–12 and 13–15 years old), malocclusion was diagnosed in 84.6% of the subjects. The most common defect was class I (68.4%) and dental anomalies, i.e. 44.1% in the upper arch and 40.3% in the lower arch. Distocclusion defects – class II – occurred in 27.7% of the cases [16]. As regards the studies conducted on 2,617 Albanian children aged 7–15, malocclusion class I (40.4%) and class II (29.2%) dominated [17]. In Italy, 516 pupils, aged 13, were examined. Dental defects, crowding and crossbite, were found to be the most common [18].

As regards Asia, in India the prevalence of malocclusion in children aged 6–12 was assessed in a group of 2,135 subjects. Class I defects were identified in 48.3%, class II in 13.9% and crowding of the lower teeth in the anterior section in 11.8% [19]. In a different region of India, the study covered the pupils of 5 schools, aged 10–15. Malocclusion was identified in 53.7% of the cases. Class I defects were observed in 75.2% and class II in 23%. Overbite was assessed as increased in 27.7% and overjet in 25.1% [21]. The examination of the Indian children from the Maharashtra region, aged 6–13, showed malocclusion in 33% of the subjects (Kumar et al. 2014). In a group of 200 Vietnamese pupils, aged 12, and a group of 200 pupils, aged 18, class I defect was diagnosed in 67% jointly in both groups, class II defect in 17.5%, increased overjet in 36.3% and increased overbite in 26.3% (Nguyen et al. 2014).

Conclusions

The analysis of the outcomes obtained by the quoted authors allows us to draw the following conclusions: occlusal defects are diagnosed in children and adolescents both in Poland and elsewhere and the prevalence of the mastication anomalies depends neither on race nor on ethnic origin.

Acknowledgements

Conflict of interest statement
The authors declare no conflict of interest.

Funding sources
There are no sources of funding to declare.

References

1. Ziemiańska-Maczek J. Częstość występowania wad zgryzu u dzieci jedenastoletnich z terenów wiejskich powiatu nowotarskiego województwa małopolskiego. Implantoprotetyka. 2007;8(3):40–42.
2. Warsz M, Rudnicka-Siwek K. Ocena stanu narządu żucia u 9–11-letnich dzieci ze szkół podstawowych z okolic Lublina pozbawionych gabinetów stomatologicznych. Dent Med Probl. 2009;46(2):162–167.
3. Rojek R, Lisiecka K. Analiza stanu zgryzu 12-latków w dawnym województwie szczecińskim w latach 1987–2003. Mag Stomatol. 2009;1:20–24.
4. Grodzka I, Szarmach I, Bugała-Musiatowich B. Zależności między nieprawidłowościami zgryzowymi a parafunkcjami w populacji młodzieży gimnazjalnej w Białymstoku. Dent Med Probl. 2009;46(3):311–318.
5. Kozanecka, Kawala B. Częstość występowania wad zgryzu a potrzeba leczenia ortodontycznego w populacji młodych dorosłych Polaków – przegląd piśmiennictwa. J Stomat. 2012;65:424–434.
6. Osmólska-Bogucka A, Buczek O, Bilińska M, Zadurska M. Parafuncje niezwarciowe u dzieci i rodziców oraz ich wpływ na występowanie wad zgryzu u dzieci na podstawie badania ankietowego i klinicznego. Nowa Stomatologia. 2014;2:63–69.
7. Marques CR, Couto GB, Orestes Cardoso S. Assessment of orthodontic treatment needs in Brazilian schoolchildren according to Dental Aesthetic Index (DAI). Community Dent Health. 2007;24(3):145–148.
8. Martins Mda G, Lima KC. Prevalence of malocclusions in 10- to 12-year-old schoolchildren in Ceará, Brazil. Oral Health Prev Dent. 2009;7(3):217–223.
9. Feldens CA, Nakamura EK, Tessarollo FR, Closs LQ. Desire for orthodontic treatment and associated factors among adolescents in Southern Brazil. Angel Orthod. 2015;85(2):224–232.
10. Gelgor IE, Karaman AI, Ercan E. Prevalence of malocclusion among adolescents in central Anatolia. Eur J Dent. 2007;1(3):125–131.
11. Al-Zubari Nabil Muhsen. Orthodontic treatment need of Yemeni children assessed with dental aesthetic index. J Orthod Sci. 2014;3(2):41–45.
12. Hanna A, Chaaya M, Moukarzel C, El Asmar K, Jaffa M, Ghafari JG. Malocclusion in elementary school children in beirut: severity and related social/behavioral factors. Int J Dent. 2015;2015:351231.
13. Bourzgui F, Sebbar M, Hamza M, Lazrak L, Abidine Z, El Quars F. Prevalence of malocclusion and orthodontic treatment need in 8–12-year-old schoolchildren in Casablanca, Marocco. Prog Orthod. 2012;13(2):164–172.
14. Bugaighis I, Karanth D. The prevalence of malocclusion in urban Libyan schoolchildren. J Orthod Sci. 2013;2(1):1–6.
15. Aikins EA, Onyeaso CO. Prevalence of malocclusion and occlusal traits among adolescents and young adults in Rivers State, Nigeria. Odontostomatol Trop. 2014;37(145):5–12.
16. Sidlauskas A, Lopatiene K. The prevalence of malocclusion among 7–15-year-old Lithuanian schoolchildren. Medicina (Kaunas). 2009;45(2):147–152.
17. Lagana G, Masucci C, Fabi F, Bollero P, Cozza P. Prevalence of malocclusion, oral habits and orthodontic treatment need in a 7- to 15-year-old schoolchildren population in Tirana. Prog Orthod. 2013;14:12.
18. Perillo L, Esposito M, Caprioglio A, Attanasio S, Santini AC, Carotenuto M. Orthodontic treatment need for adolescents in the Campania region: the malocclusion impact on self-concept. Patient Prefer Adherence. 2014;8:353–359.
19. Reddy ER, Manjula M, Sreelakshmi N, Thabitha Rani S, Aduri R, Dharamraj Patil B. Prevalence of malocclusion among 6 to 10 year old Nalgonda school children. J Int Oral Health. 2013;5(6):49–54.
20. Kumar P, Londhe SM, Kotwal A, Mitra R. Prevalence of malocclusion and orthodontic teratment need in schoolchildren – an epidemiological study. Med J Armed Forces India. 2013;69(4):369–374.
21. Kumar M, Banerjee P, Gondhalekar R, Gondhalekar R, Lall R, Parwani R. Dental occlusion among school going children of Maharashtra. J Int Oral Health. 2014;6(4):53–55.
22. Nguyen SM, Nguyen MK, Saag M, Jagomagi T. The need of orthodontic treatment among Vietnamese school children and young adults. Int J Dent. 2014;2014:132301.

Acceptance for editing: 2018-03-12
Acceptance for publication: 2018-03-27

Correspondence address:
Dorota Cudziło
Department of Orthopedics and Orthodontics
Institute of Mother and Child in Warsaw
email: klinika.ortodoncji@ump.edu.pl