

DOI: 10.21802/artm.2024.3.31.73
UDC 616.31; 617.52-089, 616.31-053.2/5

PREVALENCE AND QUALITY OF RESTORATIVE STRUCTURES OF PERMANENT TEETH IN CHILDREN FROM LOWLAND AND MOUNTAINOUS AREAS OF THE TRANSCARPATHIAN REGION OVER THE COURSE OF OBSERVATION

O.V. Klitynska, O.V. Bun, V.R. Gurando, Y.I. Bun

Uzhhorod national university, Dental faculty, Uzhhorod, Ukraine.

ORCID ID: 0000-0001-9969-2833, e-mail: oksana.klitynska@uzhnu.edu.ua,

ORCID ID: 0000-0003-0176-2210, e-mail: orest.bun@uzhnu.edu.ua

ORCID ID: 0000-0001-6303-3799, e-mail: vyacheslav.gurando@uzhnu.edu.ua

ORCID ID: 0000-0002-1792-9292, e-mail: bodnaryanka1994@gmail.com

Abstract. Introduction: Treatment of invasive forms of caries involves the removal of demineralized hard tooth tissues and the restoration of anatomical integrity using various types of restorative materials. The choice and conditions of use of these materials have clear indications. However, the durability of restorative structures, even with strict adherence to the algorithm, is not always sufficient, especially among children living in areas with biogeochemical deficiencies.

Objectives: The aim of this study was to analyze the prevalence of fillings made from different restorative materials in the permanent teeth of children living in lowland and mountainous geographical areas of the Transcarpathian region and to determine the percentage of defects in restorative structures over time.

Methods: For the analysis, 525 medical records of dental patients (form 043) from two geographical areas of the Transcarpathian region were selected, specifically from Uzhhorod, University Dental Clinic LLC, and Rakhiv, the dental office of the Rakhiv District Hospital. The period of dental treatment covered was from 2018 to 2022. Paraclinical content analysis was performed to determine the number of direct and indirect restorative structures and to assess the occurrence of defects and their loss at 6 and 12 months post-treatment. Statistical probabilities and errors were determined using the computer program STATISTICA 6.1.

Results. The rates of patient visits for the restoration of indirect restorations of permanent teeth in children living in the mountainous zone differ from those in children from the lowland zone of residence significantly after 6 months (4.0%; 2.1%; $p < 0.05$), and not significantly after 12 months (10.0%; 10.5%; $p > 0.05$). Comparing the incidence of defects, impaired fixation, or loss of various types of restorative structures in permanent teeth in children living in lowland and mountainous areas of the Transcarpathian region, it was found that the most common defects or loss of fillings made of glass ionomer cements occurred both after 6 and 12 months. The percentage distribution of the appearance of defects or loss of restorative structures made in the permanent teeth of children living in the mountainous zone from glass ionomer cements, light-curing composites on indirect restorations is 6 months (7.2%, 6.0%, 4.0%, $p > 0.05$) and 12 months (16.3%, 11.1%, 10.0%, $p > 0.05$). The differences are not significant. In the permanent teeth of children living in the low-lying area, the percentage of defects or loss of restorative structures made of glass ionomer cements, light-curing composites on indirect restorations is 6 months (6.7%, 4.4%, 2.1%, $p < 0.05$) and 12 months (20.0%, 9.6%, 10.5%, $p < 0.05$). The differences are significant.

Conclusions: Thus, when comparing the percentage of defects in various restorative structures and their loss in the permanent teeth of children living in the lowland and mountainous areas of the Transcarpathian region, no significant differences were found. Specifically, for glass ionomer cements, the defect percentages were 6.7% and 7.2% after 6 months ($p > 0.05$) and 20.0% and 16.3% after 12 months ($p > 0.05$). For direct composite restorations, the defect percentages were 4.4% and 6.0% after 6 months ($p > 0.05$) and 9.6% and 11.1% after 12 months ($p > 0.05$). For indirect composite restorations, the defect percentages were 2.1% and 4.0% after 6 months ($p > 0.05$) and 10.5% and 10.0% after 12 months ($p > 0.05$). This indicates that the differences in the percentage of defects between the lowland and mountain zones are not statistically significant for any of the types of restorative structures during the specified periods.

Keywords: permanent teeth, children, fillings, glass ionomer cements, direct restorations, indirect restorations, prevalence of filled teeth, mountainous and lowland geographical zones, Transcarpathia.

Introduction and rationale of the study. Since the prevalence of caries among children is quite high according to modern scientists [1-4], the effectiveness of treatment for this pathology requires further study. Treatment of invasive forms of caries involves the removal of demineralized hard tooth tissues and restoration of anatomical integrity using various types of restorative materials, whose choice and conditions of use have clear indications [5-9]. For the treatment of caries in permanent teeth of children, direct methods of restoration with glass ionomer cements, composite materials, or compomers are used

[10, 11]. The loss of more than a third of the tooth tissue is an indication for the use of indirect restorations, such as laboratory-made inlays or veneers [6, 11]. However, the durability of restorative structures, even with strict adherence to the algorithm, is not always sufficiently long, especially among children living in areas with biogeochemical deficiencies [12]. The present study was conducted to determine the frequency of use of different types of restorative materials in children of the Transcarpathian region and to compare the rates in different geographical areas.

The aim of the study is to analyze the prevalence of fillings made from various restorative materials in the permanent teeth of children residing in lowland and mountainous regions of the Transcarpathian area, and to determine the percentage of defects in these restorative structures over time.

Materials and methods. For the analysis, 525 medical records of dental patients (form 043) from two geographical areas of the Transcarpathian region were selected, specifically from Uzhhorod, University Dental Clinic LLC, and Rakhiv, dental office of the Rakhiv District Hospital. The period of dental treatment was from

2018 to 2022. Paraclinical content analysis was performed to determine the number of direct and indirect restorative structures and to assess the occurrence of defects in them and their loss 6 and 12 months after treatment. Statistical probabilities and errors were determined using the computer program STATISTICA 6.1 [13].

Research results. According to the analysis of medical records, the total number of children with filled permanent teeth was 525. Among them, 345 were girls (65.7%) and 180 were boys (34.3%). The total number of filled permanent teeth was 1050, with 620 (59.0%) in girls and 430 (41.0%) in boys (Table 1).

Table 1

Distribution of Permanent dentition Teeth in the Examined Children

Gender Accommodation	Girls (n=345)		Boys (n=180)		Total (n=525)	
	Aбс.	%	Aбс.	%	Aбс.	%
Lowland zone (n=340)	390	37,1	240	22,9	630	60,0
Mountainous area (n=185)	230	21,9	190	18,1	420	40,0
Total number of fillings (n=1050)	620	59,0	430	41,0	1050	100,0
Total (n=525)	345	65,7	180	34,3	525	100,0

The distribution according to the zone of residence was as follows: in the lowland zone, 630 filled permanent teeth (60.0%) were identified, of which 390 were in girls (37.1%) and 240 in boys (22.9%). In the mountainous zone, 420 filled permanent teeth (40.0%) were identified, including 230 in girls (21.9%) and 190 in boys (18.1%).

The next step was to classify the filled teeth by group and material of the filling. In the permanent teeth, 1050 fillings were made of light-curing composite materials and glass ionomer cements using the direct method, i.e., direct restorations and indirect restorations of inlays and veneers (630 units in children living in lowland areas and 420 in mountainous areas).

Among the 630 fillings in the permanent teeth of children living in the low-lying area of the Transcarpathian region, the largest group was made up of molar fillings

(43.6% - 275 fillings), followed by incisor fillings (33.4% - 210 fillings), premolar fillings (13.5% - 85 fillings), and canine fillings (9.5% - 60 fillings).

Regarding the material from which the restorative structures were made, the most common were direct restorations, namely fillings made of light-curing composite materials (555 fillings - 88.1%), of which 240 were in molars (38.1%), 190 in incisors (30.2%), 80 in premolars (12.7%), and 45 in canines (7.1%). The group of teeth restored with indirect restorations was much less common - veneers in the central teeth and inlays in the lateral teeth (9.5% - 60 units), of which 25 were in molars (3.9%), 20 in incisors (3.2%), and 15 in canines (2.4%). Fillings made of glass ionomer cements amounted to 2.4% - 15 units, of which 10 were in molars (1.6%), and 5 in premolars (0.8%) (Figure 1).

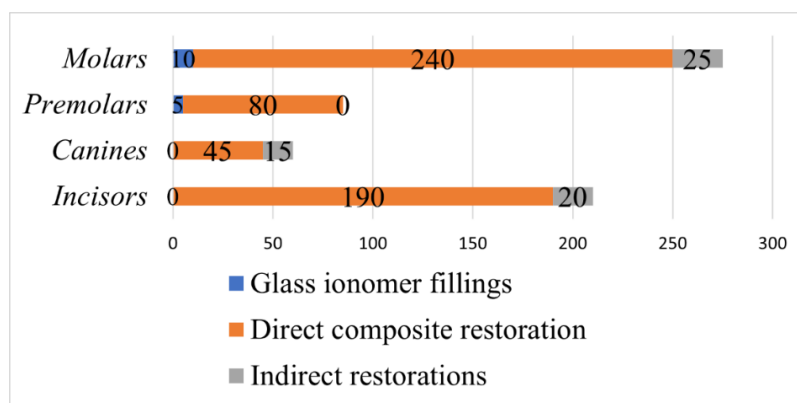


Fig. 1. Distribution of the prevalence of different restorative fillings in permanent teeth by tooth group in children living in the lowland zone.

Among the 420 fillings in the permanent teeth of children living in the mountainous zone of the Transcarpathian region, the largest group was made up of molar fillings (52.4% - 220 units), followed by premolar fillings

(20.2% - 85 units), incisor fillings (19.1% - 80 units), and canine fillings (8.3% - 35 units).

Regarding the material from which the restorative structures were made, the most common were direct restorations, namely fillings made of light-curing composite

materials (315 units - 75.0%), of which 155 were in molars (36.9%), 70 in incisors (16.7%), 65 in premolars (15.5%), and 25 in canines (5.9%). The group of teeth restored with fillings made of glass ionomer cements was much less prevalent, accounting for 13.1% - 55 units, of which 35

were in molars (8.3%), and 20 in premolars (4.7%). Indirect restorations - veneers in the central teeth and inlays in the posterior teeth - accounted for 11.9% - 50 units, of which 30 were in molars (7.2%), and 10 in incisors and canines (2.4%) (Figure 2).

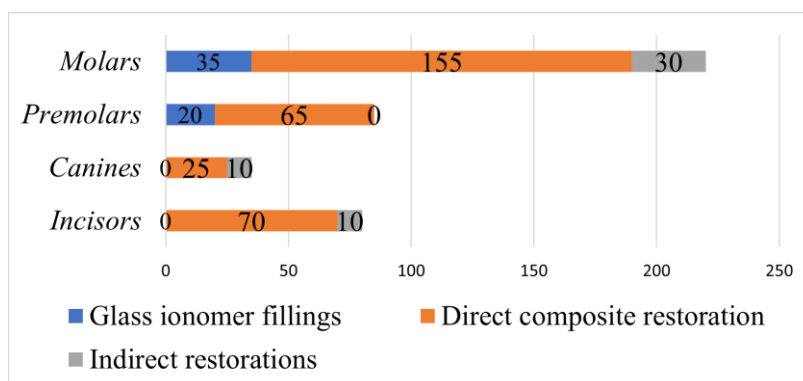


Fig. 2. Distribution of the prevalence of different restorative fillings in permanent teeth by tooth group in children living in a mountainous area.

In patients living in the low-lying area and whose reason for treatment was defects or loss of fillings from permanent teeth made of glass ionomer cements, it was found that 6.7% - 1 filling fell out within 6 months after its placement in a molar. After 12 months, defects or loss of 20.0% - 3 fillings were diagnosed, including 6.7% - 1 in premolars and 13.3% - 2 in molars of the total number of fillings placed.

In patients living in the mountainous zone and whose reason for treatment was defects or loss of fillings from permanent teeth made of glass ionomer cements, it was found that 7.2% - 4 fillings had defects or fell out within 6 months after their placement, of which 5.4% - 3 fillings were in molars, and 1.8% - 1 filling was in premolars. After 12 months, 16.3% - 9 fillings were diagnosed with defects or loss, including 10.9% - 6 in molars, and 5.4% - 3 in premolars of the total number of fillings placed.

In patients living in the low-lying area and whose reason for treatment was defects or loss of fillings from permanent teeth made of light-curing composite materials, i.e., direct composite restorations, it was found that 4.4% - 24 fillings had defects or fell out within 6 months after their placement, of which 2.7% - 15 fillings were in molars, 0.9% - 5 fillings in incisors, 0.6% - 3 in premolars,

and 0.2% - 1 in canines. After 12 months, 9.6% - 53 fillings were diagnosed with loss or defects, including 5.8% - 32 in molars, 1.8% - 10 in incisors, 1.6% - 9 in premolars and 0.4% - 2 in canines of the total number of fillings placed.

In patients living in the mountainous zone and whose reason for treatment was defects or loss of fillings from permanent teeth made of light-curing composite materials, i.e. direct composite restorations, it was found that 6.0% - 19 fillings had defects or fell out within 6 months after their placement, of which 3.1% - 10 fillings in molars, 1.3% - 4 fillings in incisors and premolars and 0.3% - 1 in canine. After 12 months, defects and loss of 11.1% - 35 fillings were diagnosed, including 5.4% - 17 in molars, 2.2% - 7 fillings in incisors and premolars, and 1.3% - 4 fillings in canines of the total number of fillings placed

In patients living in the low-lying area and whose reason for treatment was defects, impaired fixation and loss of indirect composite restorations, it was found that 2.1% - 2 structures required restorations in molars within 6 months after their placement, and after 12 months, 10.5% - 10 structures were diagnosed with loss of 10.5% - 10 structures, including 6.3% - 6 in molars, and 2.1% - 2 in incisors and canines of the total number of placed fillings. (Figure 3).

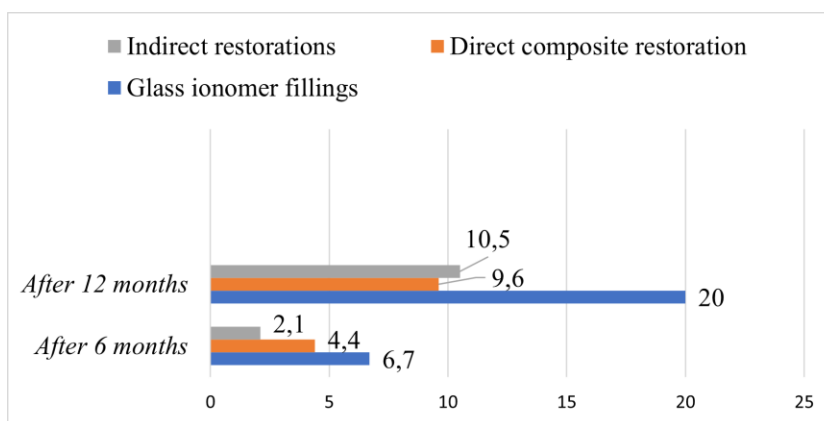


Fig. 3. Percentage distribution of defects or loss of fillings in permanent teeth of children living in a low-lying area made of different restorative materials after 6 and 12 months.

In patients living in a mountainous area and whose reason for treatment was defects, impaired fixation and loss of indirect composite restorations, it was found that 4.0% - 4 structures required restorations in molars within 6 months after their placement, and after 12 months, 10.0% - 5 structures were diagnosed with loss of 10.0% -

5 structures, including 6.0% - 3 in molars, and 2.0% - 1 in incisors and canines of the total number of placed fillings.

Figure 4 illustrates the percentage distribution of defects or loss of fillings in permanent teeth of children living in low-lying areas, made from different restorative materials, after 6 and 12 months.

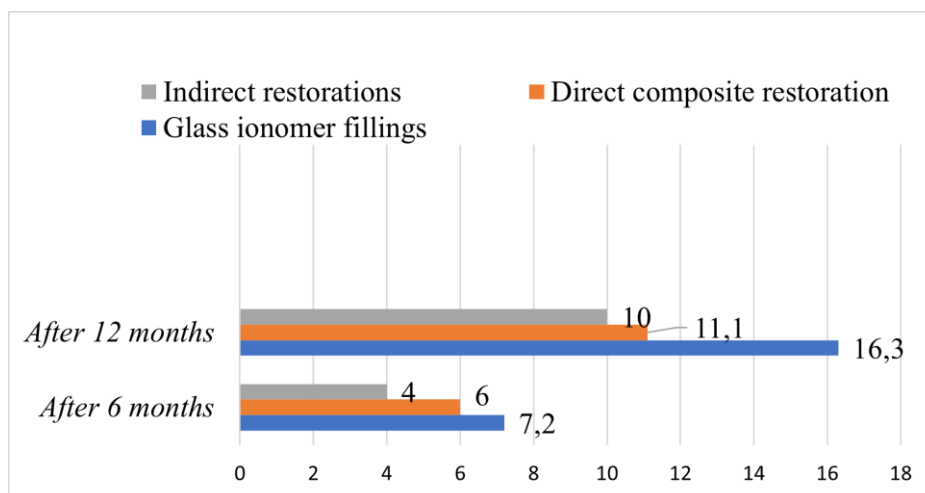


Fig. 4. Percentage distribution of defects or loss of fillings in permanent teeth of children living in low-lying areas, made from different restorative materials, after 6 and 12 months.

Discussion. The study of medical records of the children's population in the Transcarpathian region allowed us to identify 1050 filled permanent teeth, of which 630 were in children from lowland areas and 420 from mountainous areas.

The next step was to classify the filled teeth by group and material of the filling.

In the permanent teeth, 1050 fillings were made of light-curing composite materials and glass ionomer cements using the direct method, i.e., direct restorations and indirect restorations of inlays and veneers (630 units in children living in lowland areas and 420 in mountainous areas).

In permanent teeth, direct restorations in permanent molars made of light-curing composite materials prevailed in 38.1% of cases (240 units) in children of the lowland zone and in 36.9% of cases (155 units) in children of the mountainous zone.

The rates of loss or defects of fillings in permanent teeth made of glass ionomer cements in children living in the mountainous zone do not significantly differ from those in children from the lowland zone, namely after 6 months (7.2%; 6.7%; $p>0.05$) and after 12 months (16.3%; 20.0%; $p>0.05$). The rates of loss or defects of light-curing composite fillings, i.e., direct restorations of permanent teeth in children living in the mountainous zone do not differ significantly from those in children from the lowland zone, namely after 6 months (6.0%; 4.4%; $p>0.05$) and after 12 months (11.1%; 9.6%; $p>0.05$).

The rates of patient visits for the restoration of indirect restorations of permanent teeth in children living in the mountainous zone differ from those in children from the lowland zone of residence significantly after 6 months (4.0%; 2.1%; $p<0.05$), and not significantly after 12 months (10.0%; 10.5%; $p>0.05$).

Comparing the incidence of defects, impaired fixation, or loss of various types of restorative structures in permanent teeth in children living in lowland and

mountainous areas of the Transcarpathian region, it was found that the most common defects or loss of fillings made of glass ionomer cements occurred both after 6 and 12 months.

The percentage distribution of the appearance of defects or loss of restorative structures made in the permanent teeth of children living in the mountainous zone from glass ionomer cements, light-curing composites on indirect restorations is 6 months (7.2%, 6.0%, 4.0%, $p>0.05$) and 12 months (16.3%, 11.1%, 10.0%, $p>0.05$). The differences are not significant.

In the permanent teeth of children living in the low-lying area, the percentage of defects or loss of restorative structures made of glass ionomer cements, light-curing composites on indirect restorations is 6 months (6.7%, 4.4%, 2.1%, $p<0.05$) and 12 months (20.0%, 9.6%, 10.5%, $p<0.05$). The differences are significant.

Conclusions. According to the obtained data, no statistically significant differences were found when comparing the percentages of defects in various restorative structures in the permanent teeth of children living in the lowland and mountain zones of the Transcarpathian region. This applies to both glass ionomer cements and direct and indirect composite restorations.

Specifically:

- For glass ionomer cements, after 6 months (6.7% in the lowland zone and 7.2% in the mountain zone) and after 12 months (20.0% in the lowland zone and 16.3% in the mountain zone), the p-value is greater than 0.05, indicating no significant differences.

- For direct composite restorations, after 6 months (4.4% in the lowland zone and 6.0% in the mountain zone) and after 12 months (9.6% in the lowland zone and 11.1% in the mountain zone), the p-value is also greater than 0.05.

- For indirect composite restorations, after 6 months (2.1% in the lowland zone and 4.0% in the mountain zone) and after 12 months (10.5% in the lowland zone

and 10.0% in the mountain zone), the p-value is again greater than 0.05.

This indicates that the differences in the percentage of defects between the lowland and mountain zones are not statistically significant for any of the types of restorative structures during the specified periods.

Prospects for Further Research: Future research will aim to analyze the correlations between the frequency of filling loss from various restorative materials and the mineral composition of the hard tissues in permanent teeth of children residing in different geographical zones of the Transcarpathian region.

References.

- Duda LV, Lebyd OI. Poshyrennia stomatolohichnykh zakhvoriuvan sered ditei vikom 6–9 rokov. [Prevalence of dental diseases among children aged 6-9 years.]. *Klinichna stomatolohiia. - Clinical dentistry.* 2019;1:48 - 51. URL: <https://doi.org/10.11603/2311-9624.2019.1.10147> [in Ukrainian].
- Klitynska OV, Stishkovskyy AV, Hasiuk NV, Avetnikov D.S. Statistical analysis of the impact of clusters on caries prevalence and intensity in children aged 6-7 with different somatic health statuses. *Wiadomości lekarskie.* 2020; 3 (LXXIII):434-40. URL:<https://doi.org/10.36740/WLek202003104>.
- Kaskova LF, Mandziuk TB, Ulasevych LP, Andriyanova OYu, Yanko NV. Porivnialna sharakterystyka pokaznykiv kariiesu u ditei riznoho shkilnoho viku. [Comparative characteristics of caries indices in children of different school age]. *Bukovynskiyi medychnyi visnyk. – Bukovinian Medical Herald.* 2019;23(2(90)):10-15. URL:<https://doi.org/10.24061/2413-0737.XXIII.2.90.2019.27>
- Udod O, Yefimova O. Retrospektyvnyi analiz pokaznykiv stomatolohichnoi dopomohy naselenniu Donetskoi oblasti. [Retrospective analysis of indicators of dental care of the population of Donsk region]. *Visnyk stomatolohii. - Journal of dentistry.* 2023; 122(1), 94–99. <https://doi.org/10.35220/2078-8916-2023-47-1.16> [in Ukrainian].
- Kaskova LF. Dosvid zastosuvannia kompozytynykh plombuvalnykh materialiv u klinitsi dytiachoi terapevtychnoi stomatolohii [Experience in the use of composite filling materials in the clinic of pediatric therapeutic dentistry]. *Ukrainskyi stomatohichnyi almanakh - Ukrainian Dental Almanac.* 2011; 5: 62–63. [in Ukrainian].
- Udod O, Voronina H, Apiekunov H, Yefimova O. Porivnialne klinichne doslidzhennia stanu priamykh vidnovlen zubiv. [Comparative clinical study of the state of direct restoration of teeth]. *Visnyk stomatolohii. - Journal of dentistry.* 2021;117(4): 32–37. <https://doi.org/10.35220/2078-8916-2021-42-4.5>
- Cadenaro M, Maravic T, Comba A, Mazzoni A, Fanfoni L, Hilton T, et al. The role of polymerization in adhesive dentistry. *Dent Mater.* 2019. №35(1):e1-e22. URL:<https://doi.org/10.1016/j.dental.2018.11.012>.
- Grigorenko NM, Khomenko LO, Sorochenko NV, Kapitanchuk LM. Doslidzhennia in vitro poverkhnevoho sharu emali postiinykh zubiv u period vtorynnoi mineralizatsii. [In vitro study of the enamel surface layer of permanent teeth during the period of secondary mineralization.]. *Ukrainskyi stomatolohichnyi almanakh. -Ukrainian dental almanac.* 2015;1: 11-15. Access mode: <https://dental-almanac.org/index.php/journal/article/view/2/2>
- Price RB, Ferracane JL, Shortall AC. Light-curing units: a review of what we need to know. *J Dent Res.* 2015;94 (9):1179–1186. URL:<https://doi.org/10.1177/0022034515594786>. [in English].
- Klitynska OV, Shetelya VV. Obhruntuvannia vyboru plombuvalnoho materialu z urakhuvanniam stupenu kariiesrezystentnosti emali zubiv u ditei. [Justification of the choice of filling material taking into account the degree of caries resistance of tooth enamel in children.]. *Ukraina. Zdorovia natsii. - Ukraine. Health of the nation.* 2019;1(54):150-3. URL: <https://doi.org/10.24144/2077-6594.1.0.2019> [in Ukrainian].
- Klitynska OV, Hasiuk NV, Hasiuk PA, Vasko AA, Gurando VR, Zorivchak TI, Stishkovskyy AV. Statistical analysis of criteria for efficiency of filling of permanent teeth in children. *Acta stomatologica Naissi.* 2021; 84 (37):2232-40. URL: <https://doi.org/10.5937/asn2184232K> [in English].
- Klitynska OV, Stishkovskyy AV, Hasiuk NV. Analiz vplyvu rivnia stresu u ditei 6-7 rokov, yaki postiino prozhyvaiut v umovakh bioheokhimichnoho defitsytu fluoru ta yodu na pokaznyky zakhvoriuvanosti na kariies. [Analysis of the influence of the level of stress in children aged 6-7 years, who constantly live in conditions of biogeochemical deficiency of fluorine and iodine, on caries incidence rates]. *Bukovynskiyi medychnyi visnyk. - Bukovyna Medical Herald.* 2020;2(94): 46–51. URL:<https://doi.org/10.24061/2413-0737.XXIV.2.94.2020.42>
- Majboroda RJe. Komp'juterna statystyka : pidruchnyk [Computer statistics: textbook]. 2019. Kyi'v : VPC Kyi'vs'kyj universytet. [in Ukrainian].

Information on conflict of interest. The authors declare that there is no conflict of interest regarding the publication of this article.

Funding information. The author guarantees that he did not receive any remuneration in any form that could influence the results of the work.

All authors reviewed the results and approved the final version of the manuscript.

УДК 616.31;617.52-089,616.31-053.2/5

ПОШИРЕНІСТЬ І ЯКІСТЬ ВІДНОВЛЮВАЛЬНИХ КОНСТРУКЦІЙ ПОСТІЙНИХ ЗУБІВ У ДІТЕЙ, МІЖКАНЦІВ НИЗИННОЇ ТА ГІРСЬКОЇ ЗОН ЗАКАРПАТСЬКОЇ ОБЛАСТІ В ДИНАМІЦІ СПОСТЕРЕЖЕННЯ

О.В. Клітинська, О.В. Бунь, В.Р. Гурандо, Я.І. Бунь

Ужгородський національний університет,
стоматологічний факультет, Ужгород, Україна.
ORCID ID: 0000-0001-9969-2833,
e-mail: oksana.klitynska@uzhnu.edu.ua
ORCID ID: 0000-0003-0176-2210,

e-mail: orest.bun@uzhnu.edu.ua
ORCID ID: 0000-0001-6303-3799,
e-mail: vyacheslav.gurando@uzhnu.edu.ua
ORCID ID: 0000-0002-1792-9292,
e-mail: bodnaryanka1994@gmail.com

Резюме. Вступ. Лікування інвазивних форм карієсу полягає у видаленні демінералізованих твердих тканин зубів і відновленні анатомічної цілісності з використанням різних видів реставраційних матеріалів, їх вибір й умови застосування мають чіткі покази. Проте довговічність відновлювальних конструкцій навіть при чіткому дотриманні алгоритму не завжди є достатньо тривалою, особливо серед дітей, котрі мешкають у зонах біогеохімічних дефіцитів.

Мета – проаналізувати поширеність пломб із різних відновлювальних матеріалів у постійних зубах дітей, котрі мешкають у низинній і гірській географічних зонах Закарпатської області та встановити відсоток появи дефектів відновлювальних конструкцій у динаміці спостереження.

Методи дослідження. Для аналізу відібрано 525 медичних карток стоматологічних хворих (форма 043) з двох географічних зон Закарпатської області, зокрема м. Ужгород, ТОВ «Університетська стоматологічна поліклініка» та м. Рахів стоматологічний кабінет

Рахівської районної лікарні, термін лікування зубів 2018-2022 роки. Параклінічний контент-аналіз був здійснений із метою виокремлення кількості прямих і непрямих відновлювальних конструкцій та визначення появи дефектів у них та їх випадіння через 6 та 12 місяців після проведення лікування. З'ясування статистичних вірогідностей і похибок здійснювали з використанням комп'ютерної програми STATISTICA 6.1

Висновки. Таким чином, при порівнянні відсотків появи дефектів різних відновлювальних конструкцій і їх випадіння в постійних зубах дітей, які проживають в низинній та гірській зонах Закарпатської області, встановлено невірогідні відмінності при застосуванні склоіономерних цементів як через 6 місяців (6,7%;7,2%; $p>0,05$) так і через 12 місяців (20,0%;16,3%; $p>0,05$); при прямих композитних реставраціях через 6 місяців (4,4%;6,0%; $p>0,05$) та через 12 місяців (9,6%;11,1%; $p>0,05$); при непрямих композитних реставраціях через 6 місяців (2,1%;4,0%; $p>0,05$) та через 12 місяців (10,5%;10,0%; $p>0,05$).

Ключові слова: постійні зуби, діти, пломби, склоіономерні цементи, прямі реставрації, непрямі реставрації, поширеність пломбованих зубів, гірська та низинна географічні зони, Закарпаття.

Стаття надійшла в редакцію 14.06.2024 р.
Стаття прийнята до друку 16.09.2024 р.