

# Dental treatment of children under general anesthesia during the period of martial law

Oleksandr A. Kaniura, Olga I. Koval, Nataliia V. Bidenko

BOGOMOLETS NATIONAL MEDICAL UNIVERSITY, KYIV, UKRAINE

## ABSTRACT


**Aim:** To summarize the experience of providing dental medical care under general anesthesia to children from different regions of Ukraine during the martial law, taking into account the factors affecting the choice of optimal conditions for dental treatment.

**Materials and Methods:** Dental treatment under general anesthesia of 1,258 children from different regions of Ukraine has been performed since March 2022. The condition of the teeth (df, df+DMF, DMF) and hygienic state of the oral cavity (OHI-S) were determined. The level of awareness of parents regarding the preservation of children's dental health was studied through a questionnaire.

**Results:** An unsatisfactory oral hygiene, a high level of caries were found in the vast majority of children. The highest df was observed in the group of children aged 3 to 6 years ( $7.14 \pm 0.33$ ), which is significantly higher than in the group of children under 3 years of age ( $4.32 \pm 1.04$ ,  $p \leq 0.05$ ). The worst oral hygiene was observed in children aged 6-12 years ( $OHI-S 2.62 \pm 0.32$ ). An insufficient level of awareness of parents and children regarding dental health was revealed. A total of 1,712 operations under general anesthesia were performed. The majority of patients could not regularly appear for follow-up examinations due to the forced departure from the country.

**Conclusions:** The organization of dental treatment under general anesthesia allows solving a number of problems of dental care for children during the war.

**KEY WORDS:** Dental caries, general anesthesia for children, organization of dental care, martial law, dentistry during the war

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## INTRODUCTION

The dental health of Ukrainian children is deteriorating, it is largely due to the large-scale invasion of Russia and the introduction of martial law in Ukraine (Decree of the President of Ukraine dated February 24, 2022). In connection with the hostilities, many Ukrainian families were forced to leave their homes and did not have access to either medical or dental care for a long time [1-3]. Therefore, one of the urgent issues in the conditions of martial law is the issue of organization and provision of dental care to children.

## AIM

To summarize the experience of providing dental medical care under general anesthesia to children from different regions of Ukraine during the Martial Law, taking into account the factors affecting the choice of optimal conditions for dental treatment.

## MATERIALS AND METHODS

For 21 months, starting from March 17, 2022, on the basis of the Dental Medical Center of the Bogomolets National Medical University (SMC of NMU) performed dental

examination and treatment under general anesthesia of children from different regions of Ukraine (a total of 1,258 people under the age of 18 were examined and treated) [4,5]. Examination of the oral cavity included an assessment of the hard tissues of the teeth (df, df+DMF, DMF) and the hygienic state of the oral cavity (according to the OHI-S). The level of awareness of parents regarding the preservation of children's dental health was studied through a questionnaire. When choosing a method of dental treatment in children, their general somatic, psycho-emotional condition was taken into account, as well as the real possibility of regular visits to the dentist in order to continue treatment, check-ups and preventive measures was assessed. Information about each examined person, including social factors (belonging to privileged categories, internal and external movements due to the introduction of martial law, etc.), was entered into the Medical Card of the dental patient [6,7]. The obtained data were processed by generally accepted variational statistical methods using a personal computer and the R-Statistics (2001) statistical software package. The reliability of the difference in the dental examination data in different age groups was assessed using the Student, Mann-Whitney,  $\chi^2$ .

**Table 1.** Region of registration and transfer of children who received dental care during the period of martial law in Ukraine

Place of residence	The number of persons who received dental treatment	Movement of persons who have received dental care	
		Movement of persons who have received dental care	The number of children returned to Ukraine from among those who went abroad after treatment
Kyiv	759	521 (68,64%)	43 (8,25%)
Kyiv region	362	187 (51,66%)	37 (19,79%)
Chernihiv	27	9 (33,33%)	2 (22,22%)
Chernihiv region	32	14 (43,75%)	4 (28,57%)
Kherson	5	5 (100%)	-
Kherson region	7	7 (100%)	-
Zhytomyr	6	3 (50%)	1 (33,33%)
Zhytomyr Region	12	5 (41,67%)	1 (20,00%)
Rivne	11	6 (54,55%)	2 (33,33%)
Volyn region	13	8 (61,54%)	2 (25%)
Zaporizhzhia	6	6 (100%)	-
Zaporizhzhia region	8	6 (75%)	-
Kharkiv	4	4 (100%)	-
Kharkiv region	3	3 (100%)	-
Mykolayiv	2	2 (100%)	-
Mykolayiv region	1	1 (100%)	-
In total	<b>1258</b>	<b>787</b> <b>(62,55%)</b>	<b>92</b> <b>(11,69%)</b>

## RESULTS

Dental care for children was provided on the basis of the SMC of Bogomolets NMU in the period from 17.03.2022 to 24.02.12.2024. Dental examination was carried out and dental treatment was provided to 1258 persons under the age of 18 from different regions of Ukraine (Table 1).

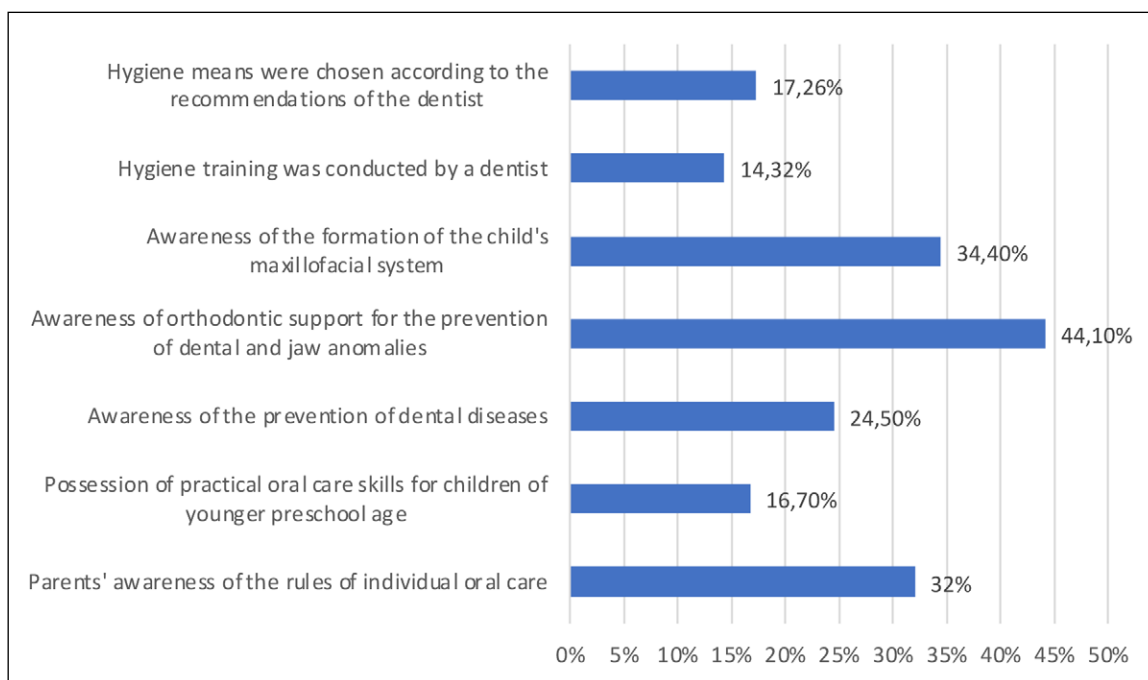
As can be seen from Table 1, residents of Kyiv and Kyiv region, as well as residents of the regions that were most affected by the war, turned to the SMC of NMU. A third (34.82%) of the children who sought help during the period of martial law live in rural areas.

It is worth noting that almost two-thirds of the treated children (787 families - 62.55%) were later taken abroad

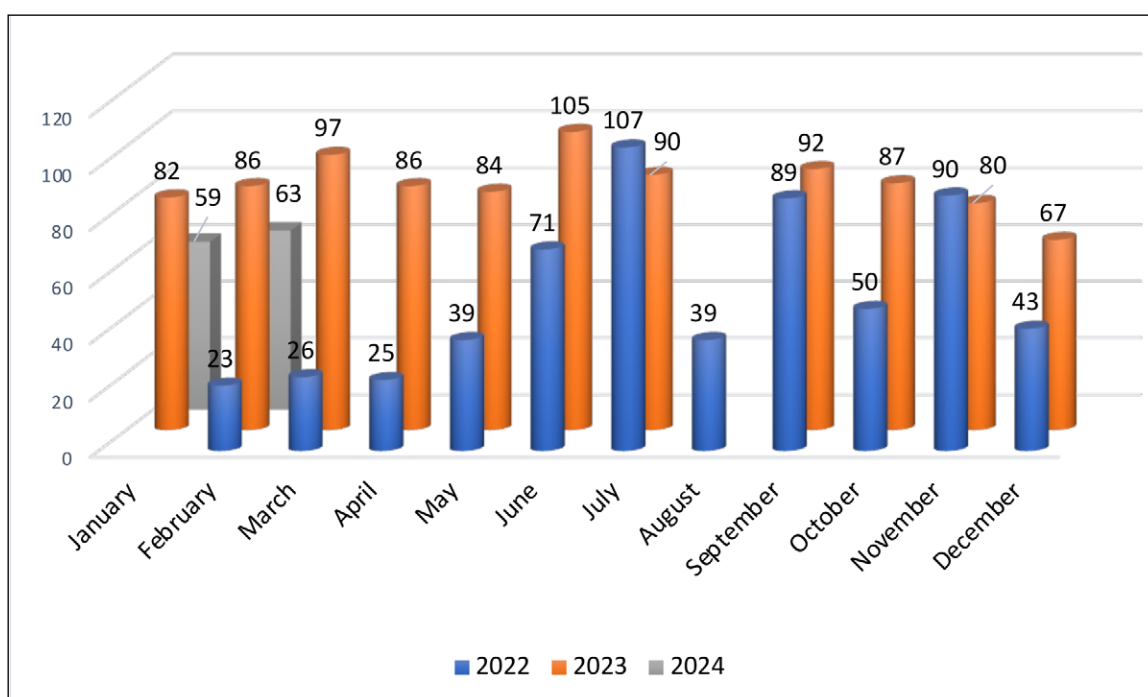
by their parents with a plan to save them from the war; of them: city residents – 556 (44.2%), rural areas – 231 (18.36%). Subsequently, 92 families returned to Ukraine, which is only 11.69% of the total number of those who came.

During the dental examination, an unsatisfactory state of oral hygiene, a high level of caries and the prevalence of its complicated forms were found in the vast majority of children (Table 2).

The highest df was observed in the group of children aged 3 to 6 years ( $7.14 \pm 0.33$ ), which is significantly higher than in the group of children under 3 years of age ( $4.32 \pm 1.04$ )  $p \leq 0.05$ . The worst indicator of oral hygiene is observed in children aged 6-12 years (OHI-S  $2.62 \pm 0.32$ ), this indicates poor hygiene.



**Fig. 1.** Awareness of parents of examined children regarding children's dental health.



**Fig. 2.** Distribution of operations performed on children under general anesthesia in different months of 2022 and 2023/2024.

For the primary and secondary prevention of the main dental diseases, it is important to have a sufficient level of sanitary literacy of parents. The awareness of parents and children regarding the preservation of dental health acquires special importance in the conditions of martial law with limited access to a dentist. The results of the study of the parents awareness regarding the maintenance of dental health are shown in fig. 1.

Dental treatment of children under general anesthesia was carried out taking into account the clinical situation in each individual case in one or more visits according to the regulations for the dental treatment under general anesthesia [8]. A total of 1,712 operations were performed, of which 781 were urgent interventions (surgical); planned – 931 (therapeutic direction – 583; therapeutic along with planned surgical interventions – 348) (Fig. 2).

**Table 2.** Dental status of children of various ages examined during the period of martial law in Ukraine

Age (number of children)	Oral hygiene (OHI-S)	df, df+DMF, DMF
0-3 (229)	-	4,32±1,04
3-6 (541)	-	7,14±0,33*
6-12 (420)	2,62±0,32	5,98±1,28
12-18 (68)	2,38±0,15	6,79±0,24*

\* The reliability of the difference of the results from the data in the group of 0-3 years  $p \leq 0.05$ .

The choice of the method of dental treatment under general anesthesia in the examined children was determined by a number of reasons, the main ones of which were:

- A significant need for dental treatment, the need to treat caries complications.
- The need for immediate emergency care.
- Labile psycho-emotional state, high level of stress.
- Young age of the child (up to 3 years).
- Technical complexity of treatment of complicated dental caries in molars in children with insufficient level of cooperation.
- The need for simultaneous treatment of all teeth due to the impossibility of planning several visits because of forced migration or the unavailability of dental care in the near future for various reasons.

As can be seen in fig. 2, the number of patients who needed dental treatment was the highest in July 2022 (107 operations were performed), which was mostly due to the need for treatment before forced departure abroad.

It should be noted that due to the forced departure from the country, the vast majority of patients could not regularly appear for follow-up examinations, and this fact made it impossible to determine the effectiveness of treatment.

## DISCUSSION

The data we received regarding the unsatisfactory state of dental health of the population of Ukraine during the war coincide with the results of other studies both in Ukraine [9,10], as well as in other countries affected by military operations. In particular, in a study conducted in Libya during the military operations of 2016/2017 and after them, a certain dependence was found between the education of parents (which indirectly indicates their awareness, in particular, of sanitary culture) and the intensity of caries in their children, including refugees [10]. Thus, the importance of sanitary literacy for the prevention of dental diseases during the war and in the post-war period was noted. The results of our research also demonstrated the low level of dental literacy

of the population, which makes it difficult to maintain the dental health of children in extreme conditions.

The difficulty of obtaining dental care during the Wartime period is justified by objective reasons of a technical nature (lack of medical care, migration of the population, departure of doctors from abroad, destruction of dental buildings/offices/equipment [11]. At the same time, issues related to the organization, the treatment and management planning of children in the conditions of martial law has not been sufficiently studied and illuminated to date, since more attention was paid to military dentistry in the world dental literature [12-14].

In our opinion, dental treatment under general anesthesia is a priority choice for the treatment of the oral cavity during the period of martial law. Choosing this method makes it possible to provide a large amount of care in a short period of time without additional stress for the child [15,16]. At the same time, dental treatment under general anesthesia cannot provide guarantees without regular preventive measures [17]. So, children affected by wars should be identified as target groups for oral health promotion programs.

Therefore, our experience of work during the war can be useful for the organization of dental care in medical institutions of our country.

## CONCLUSIONS

The implementation of martial law in the country significantly affects the state of dental health of children and the organization of their dental treatment. It is necessary to take into account the high need for the treatment of complicated and uncomplicated caries, the unsatisfactory state of oral hygiene, the low level of sanitary literacy of parents (especially among residents of rural areas), as well as population migration, which greatly complicates the possibility of regular control of the dental status of children. The organization of dental rehabilitation under general anesthesia allows solving a number of problems of dental care for children during the war, provided that parents and children are properly educated about health.

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## CONFLICT OF INTEREST

The Authors declare no conflict of interest

## CORRESPONDING AUTHOR

**Nataliia V.Bidenko**

Bogomolets National Medical University  
34 Prospect Beresteiskyi, 03680 Kyiv, Ukraine  
e-mail: n.bidenko@nmu.ua

## ORCID AND CONTRIBUTIONSHIP

Oleksandr A. Kaniura: 0000-0002-6926-6283 **A E F**

Olga I. Koval: 0000-0002-1341-5235 **B C D E**

Nataliia V. Bidenko: 0000-0003-1132-2446 **A D E F**

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