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### **PROSTHODONTIC CARE FOR ENLISTMENT AGE MEN OF THE WESTERN REGION OF UKRAINE: MORBIDITY, ANATOMICAL AND TOPOGRAPHIC STRUCTURE, STATE OF PROVISION AND PROGNOSIS**

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Dental examinations involved 294 men of enlistment age (185 of urban and 109 of rural population) under the age of 20 years old. The prevalence and intensity of the development of prosthodontic morbidity has been determined. The anatomical and topographic description has been provided for the extracted teeth and teeth for prosthodontic rehabilitation and their ratio was provided. Extremely unsatisfactory state of prosthodontic care provision for enlistment age men of urban and rural population has been found, the satisfaction of which was only 6.2% and 3.3%, respectively, for single crowns, with almost no manufacturing of bridge dentures and implant-supported dentures. The negative prognosis for the development of prosthodontic morbidity and increase in the scope of prosthodontic care has been proved. Ways to reform the system of organization and planning of the medical care for conscripts in the Armed Forces of Ukraine have been proposed.

**Keywords:** dental morbidity, enlistment age, prosthodontic care, single crowns, bridge dentures.

### **С.В. Рачинський, С.А. Шнайдер, О.В. Лабунець, Т.В. Дієва, В.А. Лабунець, Р.М. Ступницький** **ЗАХВОРИВАНІСТЬ, АНАТОМО-ТОПОГРАФІЧНА СТРУКТУРА,** **СТАН НАДАННЯ ТА ПРОГНОЗ РОЗВИТКУ СТОМАТОЛОГІЧНОЇ ОРТОПЕДИЧНОЇ** **ДОПОМОГИ ЧОЛОВІКАМ ПРИЗОВНОГО ВІКУ ЗАХІДНОГО РЕГІОНУ УКРАЇНИ**

Проведено стоматологічні огляди 294 осіб чоловічої статі призовного віку до 20 років у Західному регіоні України, з яких 185 серед міського і 109 – сільського населення. Визначена розповсюдженість та інтенсивність ортопедичної захворюваності. Надана анатомо-топографічна характеристика видалених зубів, зубів які потребують протезування та їх відсоткове співвідношення. Встановлено, що задоволеність наданням ортопедичної допомоги чоловікам призовного віку складає всього 6,2% і 3,3% відповідно за одиночними коронками при практично повній відсутності виготовлення мостоподібних протезів і штифтових конструкцій. Доведено негативний прогноз розвитку ортопедичної захворюваності та збільшення об'єму ортопедичної допомоги. Запропоновані шляхи реформування системи організації і планування даної медичної допомоги призовникам до Збройних Сил України.

**Ключові слова:** стоматологічна захворюваність, призовний вік, протезування, одиночні коронки, мостоподібні протези.

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Currently, national researchers are concerned about the study of dental morbidity among young people, both pre-conscription trainees [1, 5, 7, 8, 10-12] and enlisted men of the Armed Forces of Ukraine [2-4].

Based on the analysis of the above publications, the wide-spread prevalence of the diseases and the intensity of their development in this category of the national population is proved and proposals for improving a range of dental treatment and prevention activities (approaches, tools, medications, rinses, etc.).

However, the issues on the state of prosthodontic morbidity in young men of enlistment age among urban and, especially, rural population, their comparative characteristics, determining the degree of

satisfaction in prosthodontic care and prognosis for the incidence of dental crown hard tissues abnormalities that require prosthetic restoration and, especially, dentition defects resulted from the rapid appearance of secondary dental anomalies and deformities at this age, are underestimated to date. Consequently, insufficient scientific publications, targeted on the features of providing prosthodontic care to such category of patients have been found.

**The purpose** of the work was to study the prevalence of dental diseases, as well as dentition and maxillofacial system's malformations in enlistment age men and enlisted men; to analyze the above diseases structure and the features of prosthodontic care for this category of population.

**Materials and methods.** The study was based primarily on fundamental investigations of domestic researchers, who reported on different range of prevalence and intensity of major prosthodontic-related diseases with maximum rates in Western region of our country, based on mass dental examinations of the population of Ukraine. Consequently, Ivano-Frankivsk region has been chosen as the basic region for our study. Comprehensive clinical examinations involved 294 men of enlistment age (185 of urban and 109 of rural population) under the age of 20 years old.

The resulting data were recorded in the "Card of prosthodontic patient examination", developed by the SI "Institute of Stomatology and Maxillofacial Surgery", which consisted of 3 main sections in the form of a dental formula with appropriate coding.

Section I designates the therapeutic and surgical status; Section II defines the dental prosthetic and orthodontic status; Section III contains the proposed type and scope of prosthodontic treatment.

Moreover, to gain the objective of the study, additional information was provided. It is a similar organizational structure of the above card, involving all dental specialties, that provides fully coverage of almost the entire dental status and determines the most optimal scope of a specialized medical care. Furthermore, in order to comply with the uniform methodological approaches to the diagnosis and the proposed type and scope of prosthodontic care, the degree of destruction of the dental crown hard tissues was determined according to V.A. Klomin; anatomical and topographic condition of tooth roots was determined according to F.N. Tsukanova; partial edentulism was defined according to Kennedy's classification, etc. The resulting data was subjected to appropriate sampling, grouping by urban and rural population and statistical processing to obtain arithmetic means in the required number of subjects to get statistically reliable data, according to the WHO's guidelines proposed for epidemiological studies in dentistry.

**Results of the study and their discussion.** The rates of the prevalence and intensity of development of prosthodontic-related diseases in enlistment age (under 20 years old) men of the Western region of Ukraine, both among urban and rural population, are presented in table 1. The comparative analysis shows that they are fairly high, taking into account the young age of the examined subjects and their significant difference depending on the medical-geographical region of their place of residence.

Table 1

**Prosthodontic morbidity in enlistment age men of Ivano-Frankivsk region, per 1000 individuals**

Population type	Number of prosthodontic individuals	Number of teeth for prosthodontic rehabilitation	Number of dentition defects for prosthodontic rehabilitation	Number of extracted teeth		Number of teeth and dentition defects for prosthodontic rehabilitation	
				Total	Per 1 subject	Total	Per 1 subject
urban	275.7	578.4	189.2	210.8	0.21	767.6	0.77
rural	522.9	1302.8	596.3	651.4	0.65	1899.1	1.90

The data, presented in Table 1, shows that the incidence of prosthodontic-related diseases in urban and rural men of enlistment age is 275.7 and 522.9 people, respectively, per 1000 population of this age and gender. The latter shows that the prevalence of this pathology among the rural population is almost 2 times higher compared to the urban population.

An even more striking clinical situation is observed with regard of intensity of the above morbidity.

Apparently, the number of teeth for prosthodontic rehabilitation, due to decayed dental crown hard tissues, is accounted for 1302.8 teeth per 1000 individuals among rural residents of enlistment age and 578.4 teeth per 1000 individuals among urban residents of the above age group, i.e., by 2.3 higher.

A similar tendency can be found in the number of dentition defects among this category of the population. Thus, the resulting data (Table 1) shows that the number of dentition defects among the rural population is 596.3 against 189.2 among the urban population, i.e., by 3.2 times higher. At the same time, the amount of extracted teeth in rural residents is accounted for 651.4 against 210.8 in urban residents, which are by 3.1 times higher.

Obviously, such negative tendency is observed when considering the total number of dentition defects and teeth with decayed coronal portion of hard tissues for prosthodontic rehabilitation and the amount of extracted teeth and teeth for prosthodontic rehabilitation, accounting for 1899.1 and 1954.2, respectively, in rural residents and 767.6 and 789.2, respectively, in urban residents, i.e., by 2.5 and 2.5 times, respectively, higher among rural residents.

Consequently, the findings of the study show the high level of prosthodontic morbidity among enlistment age men of the Western region of Ukraine, given their relatively young age, with extremely two-fold higher rates in rural residents both in its incidence and intensity of manifestation.

Therefore, anatomical and topographic characteristics of the structure of the decayed teeth and dentition defects for prosthodontic rehabilitation are crucial. Table 2 and 3 present the findings of the analysis of the anatomical and topographic structure of the dental abnormalities for prosthodontic rehabilitation in different groups of enlistment age men of the Ivano-Frankivsk region.

The resulting data shows that 6-teeth, regardless of the type of jaw, are being the most frequently decayed and require prosthodontic rehabilitation most of all both among urban and rural residents. Thus, in urban residents it is 58.6% on the upper jaw, 64.9% on the lower jaw, and among rural residents it is 48.9% and 62.3%, respectively. The 7-teeth are rated the second in the incidence of dental lesions, accounting for 17.2% on the upper jaw and 29.8% on the lower jaw, in the urban population and 15.1% and 32.1%, respectively, in the rural population.

Table 2

**Anatomical and topographic characteristics of decayed teeth in enlistment age men of the Ivano-Frankivsk region, required prosthodontic rehabilitation, %**

Population	Jaw	Dental formula															
		8	7	6	5	4	3	2	1	1	2	3	4	5	6	7	8
Urban	upper	–	3.5	27.6	1.7	1.7	–	3.5	3.5	3.5	5.2	1.7	1.7	1.7	31.0	13.7	–
	lower	–	15.8	35.1	–	1.8	–	–	–	–	–	–	1.8	1.8	29.8	14.0	–
Rural	upper	–	8.1	25.6	3.5	2.3	1.2	4.7	3.5	4.7	5.8	2.3	4.7	3.5	23.3	7.0	–
	lower	–	16.0	34.6	2.5	–	–	–	1.2	–	–	–	1.2	1.2	27.7	16.0	–

Subsequently, according to the decline in percentage, the 2-teeth are decayed and accounted for 8.7% and 10.5% among urban and rural enlistment age men, respectively. In this case, the decayed coronal portion of the dental hard tissues on the upper jaw is the primary cause for tooth loss in both urban and rural populations. Quite similar indices are recorded between the 4- and 5-teeth and the least decayed are canines and incisors on the lower jaw.

The findings of the study of the anatomical and topographic structure of the extracted teeth and their amount in the above category of population are presented in table 3.

Table 3

**Anatomical and topographic characteristics of extracted teeth in enlistment age men of the Ivano-Frankivsk region, %**

Population	Jaw	Dental formula																
		8	7	6	5	4	3	2	1	1	2	3	4	5	6	7	8	
Urban	upper	–	–	25.0	18.8	6.3	–	–	–	–	–	–	–	6.3	6.3	37.5	–	–
	lower	–	10.0	50.0	3.9	–	–	–	–	–	–	–	3.9	15.4	34.6	–	–	–
Rural	upper	–	3.7	25.9	14.8	7.4	–	–	–	–	–	–	7.4	7.4	25.9	7.4	–	–
	lower	–	6.8	40.9	–	–	–	–	–	–	–	–	–	–	47.7	4.6	–	–

The findings show that the 6-teeth are being the most frequently extracted in the subjects, regardless of place of residence, namely, in the urban population it is accounted for 57.5% on the upper jaw and 84.6% on the lower jaw, and among the rural residents it is 51.8% and 88.6%, respectively. Subsequently, the extraction of the maxillary 5- and 4-teeth are rated second, accounting for 25.1% and 19.1%, respectively, in urban residents and 12.6% and 3.9%, respectively, in rural residents with almost complete absence of extracted teeth on the lower jaw.

The 7-teeth are rated third in the incidence of tooth extraction, accounting for 11.1% on the upper jaw and 11.4% on the lower jaw in rural residents, whereas in the urban residents tooth extraction on the lower jaw is 10.0% with the relatively intact upper jaw. Notably, canines and incisors were not extracted both among urban and rural residents of the above age and gender. Moreover, the dependence of the amount of extracted teeth on the type of jaw has been established. Thus, the findings show that the incidence of tooth extraction on the lower jaw, both among urban and rural population, is by 1.6 times higher than on the upper jaw, accounting for 61.5% and 61.9%, respectively, against 38.5% and 38.1%, respectively, with a total majority of them among rural residents, namely, 247.7 against 81.1 teeth on the upper jaw and 403.7 against 129.7 teeth

on the lower jaw compared to the urban population per 1000 people of the above age. It is by 3.1 and 3.1 times, respectively, with the equality of their percentage depending on the type of jaws.

The analysis of the topography of dentition defects has revealed only Class III defects according to the Kennedy classification in the above category of the national population, accounting for 45.7% on the upper jaw and 54.3% on the lower jaw among the urban population; among the rural residents it is accounted for 35.9% and 64.1%, respectively.

In practical public health care the planning of prosthodontic care should involve data on its scope and structure of dentures to be manufactured, the number and structure of already manufactured dentures, determining the degree of satisfaction with provided dental care by certain category of the population. The findings of the investigations have established that the number of single crowns, bridge dentures and implant-supported dentures to be made for urban population is 2098.0, 189.2 and 102.7, respectively, per 1000 individuals of the above age group; 2491.0, 558.8 and 271.0 dentures, respectively, should be made for rural residents. The total amount of manufactured dentures is extremely insignificant, accounting for 129.7 and 82.6 single crowns for urban and rural population, respectively. At the same time, dental examinations have revealed that manufacture of bridge dentures and dental implants has practically not been carried out. And this is not only extremely unsatisfactory, but also harmful, given that it can lead to rapid development of secondary dental anomalies and deformities at such a young age, subsequently significantly complicating the provision of the effective prosthodontic care with the increase in its scope and costs of dental care.

Consequently, a fairly clear issue arises as for the near future prognosis for the development of prosthodontic morbidity in the above category of the population.

Our prognosis involved issues on the current extremely unsatisfactory state of the organization of prosthodontic care provision for enlistment age men and, unfortunately, still short-term functioning of fillings in masticatory teeth, as well as the presence of a large number of untreated teeth of the above group with the destruction of its crown portion by 1/3 – 1/2 of its volume, i.e., potentially the teeth, required absolute prosthetics by the relevant crowns in the near future without proper care. Consequently, Table 4 presents the number of teeth that require prosthodontic treatment, and destroyed or filled teeth on the 1/3 – 1/2 of the coronal portion of the masticatory group in the above category of the population.

Table 4

**The number of individuals and teeth that required prosthodontic treatment and destroyed or filled teeth on the 1/3 – 1/2 of the coronal portion of the masticatory group in enlistment age men of Ivano-Frankivsk region, per 1000 subjects**

Population	Number of individuals	The number of teeth that require prosthodontic treatment			The number of teeth destroyed or filled on 1/3 – 1/2 of the coronal portion			Total number of teeth		
		Total	Ratio, %	Ratio, abs. value	Total	Ratio, %	Ratio, abs. value	Total	Ratio, %	Ratio, abs. value
urban	881.5	578.4	30.8	1.0	5210.8	50.5	1.02	5789.2	47.5	1.0
rural	834.6	1302.8	69.2	2.1	5109.9	49.5	0.98	6412.7	52.5	1.1

Thus, the data presented in Table 4 shows that the number of individuals with the above dental lesion among urban and rural residents is 881.5 and 834.6 per 1000 subjects, respectively, and the number of teeth with destroyed or filled on 1/3 – 1/2 of the coronal portion of the masticatory group reaches 5210.8 and 5109.9, respectively. At the same time, with the current organization of dental care the total number of teeth that already need prosthodontic treatment and the number of teeth with destroyed or filled on 1/3 – 1/2 of the coronal portion can reach up to 5789.2 and 6412.7 teeth, respectively, among urban and rural men of enlistment age per 1000 subjects, respectively.

Thus, given the above, and taking into account the current extremely unsatisfactory state and level of provision of prosthodontic care, the prevalence of prosthodontic morbidity only in term of defects of the dental crown hard tissues may increase by 3.2 times among urban population and by 1.6 among rural population in the near future. Of note, it is already extremely high in rural residents, accounting for 522,9 individuals per 1000 population of the above age and gender (table 1).

The findings of the study on the prevalence of dental morbidity among young people (20 years old), and especially in men of enlistment age, are confirmed by the investigations of other authors who studied the state of dental morbidity among young people in other regions of Ukraine [1, 6, 10], the prevalence of dental lesion in students of medical higher education institutions [13].

Data on the significant need in prosthodontic care for enlistment age men are confirmed by Semenov E.I. *et al* [11], who studied the need and provision of young population of Ukraine with dental care and their results indicate that more than 50% of young people need qualified dental care.

Admittedly, insufficient amount of research on the prevalence of dental diseases among enlistment age men, the need for dental care, including specialized one, has been found, and previous studies made by some authors [2, 3, 4, 9] consider a rather narrow range of issues, are outdated and somewhat have lost their relevance to date due to the real situation in the Armed Forces of Ukraine, which are currently involved in the hostilities in the Donbass region.

### Conclusions

1. The findings of the study have established a high prevalence of prosthodontic morbidity among enlistment age men of the Western region of Ukraine, which accounted for 275.7 people among urban and 522.9 people among rural population per 1,000 subjects under 20 years old.

2. Prosthodontic treatment is required for significant amount of dentition defects and teeth with destroyed coronal portion of hard tissues, accounted for 189.2 and 578.4, respectively, among urban population and 596.3 and 1302.8, respectively, among rural population per 1000 individuals of the above age and gender.

3. The dependence of the amount of tooth extraction on the type of jaw has been established. In this case, both among urban and rural residents of the above age and gender, they are extracted by 1.6 times more frequently on the lower jaw in contrast to the upper jaw. Only Class III defects according to the Kennedy classification have been found in all subjects.

4. Unsatisfactory state of prosthodontic care provision for the above category of population has been established: the need for manufacturing of single crowns, bridge dentures and implant-supported dentures per 1000 individuals among urban residents exceeds the actual number of manufactured dentures by 10 times, and by 12-15 times among the rural residents.

5. The prevalence of prosthodontic morbidity in the enlistment age men may increase by 3.2 and 1.6 times among urban residents and rural residents, respectively, accounting for 881.5 and 834,6 individuals, respectively, per 1000 subjects.

*Prospects of further research will encompass the creation of a science-based effective system of introduction of mandatory active type of outpatient supervision of the above category of population in need of prosthodontic care, with legal permanent annual monitoring of the above diseases and control over their implementation, as well as the study the possibility of creating a system of guaranteed free prosthodontic care for the above category of the population at the national level with their assignment to the privileged group for dental services provision, given their exclusive place and status in our country, which is in a state of hostilities in the Donetsk region.*

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