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## STUDY AND EVALUATION OF MEASURES ON INFECTIOUS SAFETY OF MEDICAL PERSONNEL AND PATIENTS WHEN PROVIDING DENTAL CARE IN ACCORDANCE WITH REGULATORY DOCUMENTS

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### Summary

**Introduction:** According to WHO and international experts, at the beginning of the new millennium, the problem of infectious safety of health care has acquired global proportions in all countries of the world, regardless of their level of development. The problem of combating infections associated with the provision of medical care (HCAI) is relevant in all countries of the world, that is, an increase in HCAI leads to an increase in mortality, morbidity and cost of treatment, as well as an increase in health risks for patients and medical personnel. According to medical experts, infection control was carried out, including universal precautions such as the use of protective measures and personal protective equipment to prevent the transmission of HIV and other measures, criminal methods through blood, protection of patients and healthcare workers from possible transmission of infection in medical and dental organizations. High risks of the spread of infections are a serious problem in dentistry, since dental care is the most common medical service among the population, and at the same time, the situation regarding HIV infection, hepatitis B and C continues to remain tense.

**Aim:** Study and evaluate measures to comply with infection safety in dental organizations in accordance with regulatory documents.

**Materials and methods:** To control the safe conduct of medical procedures, we conducted monitoring studies in dental institutions of the East Kazakhstan region and the Abay region (Ust-Kamenogorsk, Semey, Zaisan, Ayaguz, Kurchum, military hospital Semey) in order to reduce the incidence of hepatitis B and C, COVID-19 and HIV infection. The research was carried out on the basis of 11 dental institutions in the East Kazakhstan region and the Abay region from January to June 2023. Evaluation and monitoring using the assessment tool was carried out through direct observation of existing infection control practices in dental health care organizations.

**Results:** Failure to comply with infection control and safety, sanitary and hygienic requirements, safety of medical procedures, stages of disinfection and sterilization, medical waste management, insufficient provision of disposable medical products and personal protective equipment creates a risk of transmission of bloodborne infection.

Not all dental organizations understand the importance of knowledge and implementation of basic requirements and measures for the prevention of infections associated with the provision of medical dental care to the population.

**Conclusion:** The study proves the need to strengthen measures to control infection safety in dental institutions. The average percentage of compliance with infection control criteria in dental settings was less than 50%.

**Key words:** regulatory documents, infection control, infection safety in dentistry, monitoring, dental clinics.

### Резюме

## ИЗУЧЕНИЕ И ОЦЕНКА МЕРОПРИЯТИЙ ПО ИНФЕКЦИОННОЙ БЕЗОПАСНОСТИ МЕДИЦИНСКОГО ПЕРСОНАЛА И ПАЦИЕНТОВ ПРИ ОКАЗАНИИ СТОМАТОЛОГИЧЕСКОЙ ПОМОЩИ В СООТВЕТСТВИИ С НОРМАТИВНЫМИ ДОКУМЕНТАМИ

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**Введение:** По оценке ВОЗ и международных экспертов, в начале нового тысячелетия проблема инфекционной безопасности медико-санитарной помощи приобрела глобальные масштабы во всех странах мира независимо от уровня их развития. Проблема борьбы с инфекциями связанными с оказанием медицинской помощи (ИСМП) актуальна во всех странах мира, т.к. рост ИСМП приводит к увеличению показателей смертности, заболеваемости и стоимости лечения, а также увеличению риска для здоровья пациентов и медицинского персонала. По данным медицинских экспертов тщательный инфекционный контроль, включая универсальные меры предосторожности, таких как использование защитных мер и средств индивидуальной защиты для предотвращения передачи ВИЧ и других инфекций, передаваемых через кровь, защищает пациентов и медицинских работников от возможной передачи инфекции в медицинских и стоматологических организациях. Высокие риски распространения инфекций являются серьезной проблемой в стоматологии, так как стоматологическая помощь является самой распространенной медицинской услугой среди населения, и в то же время ситуация в отношении ВИЧ-инфекции, гепатитов В и С продолжает оставаться напряженной.

**Цель исследования:** Изучить и оценить мероприятия по соблюдению инфекционной безопасности в стоматологических учреждениях в соответствии нормативными документами.

**Материалы и методы:** Для контроля над безопасным проведением медицинских процедур нами было проведено мониторинговые исследования в стоматологических учреждениях ВКО и области Абай (г.Усть-Каменогорск, г.Семей, г.Зайсан, г.Аягуз, г.Курчум, военный госпиталь г.Семей) с целью снижения уровня заболеваемости населения гепатитами В и С, COVID-19, ВИЧ-инфекцией. Исследования проводились на базе 11 стоматологических учреждениях ВКО и области Абай с января по июнь 2023 г. Оценка и мониторинг с использованием оценочного листа проводились методом прямого наблюдения за имеющимися практиками инфекционного контроля в стоматологических организациях здравоохранения.

**Результаты:** Несоблюдение инфекционного контроля и безопасности, санитарно-гигиенических требований, безопасности медицинских процедур, этапов дезинфекции и стерилизации, управления медицинскими отходами, недостаточное обеспечение одноразовыми изделиями медицинского назначения и средствами индивидуальной защиты создает риск передачи гемоконтактной инфекции.

Не все организации стоматологического профиля понимают важность знания и исполнения основных требований и мероприятий по профилактике инфекций, связанных с оказанием медицинской стоматологической помощи населению.

**Выводы:** Проведенное исследование доказывает необходимость усиления мер по контролю за инфекционной безопасностью стоматологических учреждений. Средний процент соответствия критериям инфекционного контроля в стоматологических учреждениях составил менее 50%.

**Ключевые слова:** нормативные документы, инфекционный контроль, инфекционная безопасность в стоматологии, мониторинг, стоматологические клиники.

Түйіндеме

## **НОРМАТИВТІК ҚҰЖАТТАРҒА СӘЙКЕС СТОМАТОЛОГИЯЛЫҚ КӨМЕК КӨРСЕТУ КЕЗІНДЕ МЕДИЦИНАЛЫҚ ҚЫЗМЕТКЕРЛЕР МЕН НАУҚАСТАРДЫҢ ИНФЕКЦИЯЛЫҚ ҚАУІПСІЗДІГІ БОЙЫНША ШАРАЛАРДЫ ЗЕРДЕЛЕУ ЖӘНЕ БАҒАЛАУ**

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**Кіріспе:** Дүниежүзілік денсаулық сақтау ұйымының және халықаралық сарапшылардың пікірінше, жаңа мыңжылдықтың басында денсаулық сақтаудың инфекциялық қауіпсіздігі мәселесі әлемнің барлық елдерінде олардың даму деңгейіне қарамастан жаһандық ауқымға ие болды. Медициналық көмек көрсетуге байланысты инфекциялармен (МККБИ) күресу мәселесі әлемнің барлық елдерінде өзекті, өйткені МККБИ-ның артуы өлім-жітімнің, ауру-сырқаудың және емдеу шығындарының артуына, сондай-ақ науқастар мен медициналық қызметкерлердің денсаулығына қауіп төндіреді. Медициналық сарапшылардың пікірінше, мұқият инфекциялық

бақылау, оның ішінде қорғаныс шаралары мен жеке қорғаныс құралдарын қолдану сияқты әмбебап сақтық шаралары, АИТВ, қан арқылы жұғатын және басқа инфекциялардың таралуын болдырмау үшін, емделушілерді және медицина қызметкерлерін медициналық және стоматологиялық ұйымдарда инфекцияның ықтимал берілуінен қорғайды. Инфекциялардың таралу қауіпінің жоғары болуы стоматологиядағы күрделі мәселе болып табылады, өйткені стоматологиялық көмек халық арасында ең көп таралған медициналық қызмет болып табылады, сонымен бірге АИТВ-инфекциясына, В және С гепатиттеріне қатысты жағдай шиеленісуін жалғастыруда.

**Зерттеудің мақсаты:** Нормативтік құжаттарға сәйкес стоматологиялық мекемелерде инфекциялық қауіпсіздікті сақтау шараларын зерделеу және бағалау.

**Материалдар мен әдістер:** Медициналық процедуралардың қауіпсіз жүргізілуін бақылау үшін біз Шығыс Қазақстан облысы және Абай облысының стоматологиялық мекемелерінде (Өскемен, Семей, Зайсан, Аягөз, Күршім, Семей әскери госпиталь), халық арасында В және С гепатиті, COVID-19 және АИТВ-инфекциялық аурулардың жиілігін төмендету мақсатында мониторингтік зерттеулер жүргіздік. Зерттеу Шығыс Қазақстан облысы мен Абай ауданындағы 11 стоматологиялық мекеме базасында 2023 жылдың қаңтар-маусым айлары аралығында жүргізілді. Бағалау парағы пайдалану арқылы стоматологиялық денсаулық сақтау ұйымдарындағы инфекциялық бақылаудың қолданыстағы тәжірибесін тікелей бақылау арқылы бағалау және мониторинг жүргізілді.

**Нәтижелер:** Инфекциялық бақылау мен қауіпсіздікті, санитарлық-гигиеналық талаптарды, медициналық емшаралардың қауіпсіздігін, дезинфекциялау және зарарсыздандыру кезеңдерін, медициналық қалдықтармен жұмыс істеуді сақтамау, бір рет қолданылатын медициналық мақсаттағы бұйымдармен және жеке қорғаныс құралдарымен жеткіліксіз қамтамасыз етілуі, қан арқылы жұғатын инфекцияның таралу қауіпін тудырады.

Барлық стоматологиялық ұйымдар халыққа медициналық стоматологиялық көмек көрсетумен байланысты инфекциялардың алдын алу бойынша негізгі талаптар мен шараларды білудің және жүзеге асырудың маңыздылығын түсінбейді.

**Қорытынды:** Зерттеу стоматологиялық мекемелерде инфекциялық қауіпсіздікті бақылау шараларын күшейту қажеттігін дәлелдейді. Стоматологиялық мекемелерде инфекцияны бақылау критерийлеріне сәйкестіктің орташа пайызы 50%-дан аз болды.

**Түйінді сөздер:** нормативтік құжаттар, инфекциялық бақылау, стоматологиядағы инфекциялық қауіпсіздік, мониторинг, стоматологиялық клиникалар

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#### **Introduction**

According to WHO and international experts, at the beginning of the new millennium, the problem of infectious safety of health care has acquired global proportions in all countries of the world, regardless of their level of development [22].

Every year, hundreds of millions of patients around the world are exposed to infections associated with receiving health care services in outpatient care settings. The main and most dangerous infections for human health are hepatitis B and C and HIV infection. The risk of contracting these infections is highest in the intensive care unit, long-term hospitalization, and the use of invasive treatment methods [12].

Research into patient infection safety began in the 1950s and 1960s. However, not enough attention was paid

to this problem at that time. Factual information on morbidity began to be collected and analyzed in the early 1990s. The most famous at that time was a study of medical practice conducted in the United States at Harvard in 1991 [21].

Healthcare-associated infections (HCAs) are the most important problem in ensuring the quality of medical care and creating a safe environment for patients and staff in medical care organizations, which can lead to the spread of negative consequences for the health of patients, staff and the economy of the state [5].

The problem of combating infections associated with the provision of medical care (HCAI) is relevant in all countries of the world, that is, an increase in HCAI leads to an increase in mortality, morbidity and cost of treatment, as well as an increase in health risks for patients and medical personnel [8].

According to medical experts, infection control was carried out, including universal precautions such as the use of protective measures and personal protective equipment to prevent the transmission of HIV and other measures, criminal methods through blood, protection of patients and healthcare workers from possible transmission of infection in medical and dental organizations [4].

The problem of nosocomial infection is one of the most acute in medicine, and this problem affects not only the medical, but also the social and economic aspect of the development of the state. This problem is also relevant for dental institutions. One of the significant factors affecting the health of medical staff and patients is microbial contamination. The leading role in the development and spread of infections is played by strains of microorganisms that live in the oral cavity, saliva, and blood. And blood and saliva become dangerous during the incubation period of many diseases, such as parenteral hepatitis and HIV infection. Infectious diseases may be asymptomatic, and patients may not be aware that they have the disease or may hide it, thereby facilitating its spread [15]. When dental equipment operates, microorganisms are released into the air of the work area, and employees are completely unprotected from airborne infection. Therefore, special attention should be paid to compliance with infection control rules in the dental office [16].

One of the most important measures to prevent the transmission of HCAI is infection control. It is especially relevant for dental clinics, where the doctor usually does not see the patient's medical history, but deals only with the oral cavity, which is one of the first areas of clinical manifestation of a number of infectious diseases, including HIV infection [1].

In the professional activities of a dentist, it is necessary to pay special attention to the possible impact of various risk factors for infection, including blood-borne infections [3].

High risks of the spread of infections are a serious problem in dentistry, since dental care is the most common medical service among the population, and at the same time, the situation regarding HIV infection, hepatitis B and C continues to remain tense [14].

In dentistry, a particularly pressing problem is associated with a sharp increase in the number of patients with odontogenic inflammatory diseases, which have begun to acquire a long-term and recurrent course.

When providing dental care, microorganisms found in the oral cavity, saliva, blood, directly or through contaminated objects, instruments and materials can lead to professional infection of medical personnel, as well as infection of patients. The source of infection can be patients and medical workers suffering from acute and chronic forms of purulent-septic diseases, viral hepatitis, syphilis, HIV-infected people, as well as asymptomatic carriers of other pathogenic microorganisms [7].

One of the main reasons for the infection of patients with blood-borne viral infections at a dental appointment is considered to be the lack of sufficient sanitary and hygienic knowledge and skills among medical personnel, as well as their violation of sanitary and epidemiological norms and rules, unsatisfactory quality of processing of instruments and equipment for carrying out therapeutic and diagnostic

procedures, the use of ineffective means and methods of disinfection, pre-sterilization cleaning and sterilization [7].

An important aspect of the prevention of occupational infection is the constant use of individual protection means: in addition to the gown, caps, masks, gloves, apron, mandatory use of protective glasses or screen. When performing medical services, you must use disposable gloves. Hand disinfection requirements must be strictly observed, depending on the medical procedure performed and the required level of reduction microbial contamination of the skin, follow the recommendations for the use of a specific product antiseptic [6].

The main factors creating the threat of nosocomial transmission of infections in dental institutions are: non-compliance of equipment with the necessary equipment standards, workload of doctors, staffing shortages, especially of mid-level and junior medical personnel, non-compliance with personal protective measures, low alertness regarding infection of medical workers both in government and in private dental clinics, skin damage, doctors ignoring prior reading of the entries in medical documents. To the listed risk factors it is necessary to add unacceptable neglect in the daily practice of dentists to the rules of asepsis and antisepsis [2].

The increasing incidence of nosocomial infections of the oral cavity necessitates improving the system of infection safety and infection control in dentistry.

**The purpose of the study:** Study and evaluate measures to comply with infection safety in dental organizations in accordance with regulatory documents.

**Materials and methods:**

To control the safe conduct of medical procedures, we conducted monitoring studies in dental institutions of the East Kazakhstan region and the Abay region (Ust-Kamenogorsk, Semey, Zaisan, Ayaguz, Kurchum, military hospital Semey) to reduce the incidence of hepatitis B and C, COVID-19, and HIV infection.

The research was carried out on the basis of 11 dental institutions in the East Kazakhstan region and the Abay region from January to June 2023.

During the assessment and monitoring, the assessment sheet "Assessment of the infection safety and infection control system in dental institutions" was used. Methods used include direct observation of infection control in dental health care settings, as well as demonstrations and direct participation. This assessment sheet was developed independently by the authors. The evaluation sheet consists of 25 criteria, 7 points (infection control and safety, sanitary and hygienic requirements, safety of medical procedures, disinfection, disinfection and pre-sterilization cleaning, sterilization of dental instruments and materials and medical waste management) and four columns for entering the names of criteria, assessments on performance or non-performance and their notes.

The evaluation of the criteria was carried out taking into account all the fulfilled requirements included in their composition. If one of them is not met, the entire criterion is assessed as not being met. At the end of the assessment, to summarize the results, the percentage of fulfilled criteria is calculated for departments and for the healthcare organization as a whole.

**Criteria for selecting study participants:**

*Inclusion criteria:* Dental institutions that agreed to participate in the study.

*Exclusion criteria:* Dental institutions that refused to participate in the study.

**Regulatory basis of the study.**

1) Order of the Minister of Health of the Republic of Kazakhstan dated August 11, 2020 No. KR DSM - 96/2020 “On approval of the Sanitary Rules “Sanitary and Epidemiological Requirements for Healthcare Facilities”;

2) Order of the Minister of Health of the Republic of Kazakhstan dated December 2, 2022 No. KR DSM-151 “Sanitary and epidemiological requirements for the organization and implementation of sanitary and anti-epidemic, sanitary and preventive measures to prevent infections associated with the provision of medical care”;

3) Acting order Minister of Health of the Republic of Kazakhstan dated November 5, 2021 No. KR DSM - 111. On approval of accreditation standards for medical organizations;

4) Improving infection prevention and control at the health care facility level. Preliminary practical guidance for promoting the implementation of World Health Organization (WHO) guidelines on the main components of infection prevention and control programs (<http://www.who.int/infection-prevention/tools/core-components/en/>, accessed 12 January 2019).

5) Order of the Minister of Health of the Republic of Kazakhstan dated November 12, 2021 No. KR DSM-114. Registered with the Ministry of Justice of the Republic of Kazakhstan on November 15, 2021 No. 25151. On approval of the Sanitary Rules “Sanitary and epidemiological requirements for the organization and implementation of sanitary and anti-epidemic, sanitary and preventive measures to prevent particularly dangerous infectious diseases.”

6) Order of the Minister of Health of the Republic of Kazakhstan dated May 26, 2021 No. KR DSM - 44. Registered with the Ministry of Justice of the Republic of

Kazakhstan on May 28, 2021 No. 22869 “On approval of the Sanitary Rules “Sanitary and epidemiological requirements for the organization and conduct of sanitary and anti-epidemic, sanitary preventive measures for viral hepatitis and HIV infection.”

7) Order of the Minister of Health of the Republic of Kazakhstan dated November 30, 2020 No. KR DSM-219/2020. Registered with the Ministry of Justice of the Republic of Kazakhstan on December 2, 2020 No. 21704 “On approval of the rules for providing information on medical waste.”

**Ethical issues in conducting research:**

All dental institutions that agreed to participate in the study were familiarized with the goals and objectives of the study. No intervention in the human body was planned. Everyone was guaranteed confidentiality and security of personal data. All materials obtained during the study were used only for scientific purposes. To maintain the confidentiality of data on dental institutions, each medical organization was coded in capital letters of the Latin alphabet.

The study was conducted in 2 cities of regional significance in the Abay and East Kazakhstan regions.

To collect data, letters were sent to the chief physicians of dental clinics with information about the study and a request for assistance in collecting data for the scientific study.

Duration of the study: from January to June 2023.

This work was carried out as part of a dissertation on the topic: “Study and assessment of the quality of ensuring infectious safety of medical personnel and patients when providing dental care.”

**Results**

Based on the results of the assessment, indicators were determined that characterize the infection control system status in dental institutions.

The results of the assessment and monitoring of the infection control system in dental institutions are presented in Table 1.

Table 1.

**Results of assessment the infection control status in dental institutions according to assessment criteria**

№	Group of evaluation criteria	% fulfillment of criteria by dental public health										
		A	B	C	D	E	F	G	H	I	J	K
1	Infection control and safety	50	50	75	50	50	50	75	50	50	50	50
2	Sanitary and hygienic requirements	50	50	50	75	75	50	50	50	50	25	50
3	Safety of medical procedures	50	25	50	50	50	25	50	50	50	25	25
4	Disinfection	50	50	50	50	50	50	50	50	0	50	0
5	Disinfection and pre-sterilization cleaning of dental instruments, equipment and materials	30	60	60	60	30	30	60	30	30	60	30
6	Sterilization of dental instruments and materials	40	20	60	60	80	20	20	20	40	40	40
7	Medical waste management	30	60	60	60	60	30	30	60	60	30	30
Total number of criteria executed		12	11	15	15	15	9	12	11	11	11	9
Total number of criteria observed		25	25	25	25	25	25	25	25	25	25	25

As can be seen from Table 1, according to the first criterion "Infection control and safety", deficiencies were identified in almost all dental institutions; on average, the fulfillment of the criterion is 54.5%. Thus, the package of regulatory legal acts on infection prevention is not fully available. Some organizations do not have an infection control commission. When assessing indicators characterizing the state of the infection control system in dental healthcare institutions, it was established that insufficient quantities of equipment, tools and consumables for infection prevention (sterile and examination gloves, disposable saliva ejectors, syringes, pulp extractors and antiseptics) are purchased. Not all institutions carry out measures to protect the health of medical staff.

Sanitary and hygienic requirements are not sufficiently observed in many dental institutions; on average, the percentage of fulfillment of the criterion is 52.3%. Thus, the area of dental offices does not meet hygienic requirements. The ventilation and exhaust system does not meet the standards and, moreover, it is not in working condition. Many dental facilities require renovations (the paint on the wall is missing in places, the floors are worn out, the tiles are cracked).

According to the criterion "Safety of medical procedures", implementation was 41%. The main disadvantages are the lack or insufficient use of personal protective equipment (gloves, masks, goggles, puncture-resistant shoes), bibs and disposable wipes for patients, and no antiseptic mouth rinses.

There were deficiencies in the disinfection and pre-sterilization cleaning of dental instruments, equipment and materials (on average, the percentage of fulfillment of the criteria was 41% and 43.6%). In the section "Disinfection" two dental institutions were not carried out (0%). The reasons for non-compliance are as follows: according to the disinfection and cleaning regime by zone. The rules for pre-sterilization cleaning of instruments are not followed.

The steady increase in the emergence of antibiotic-resistant organisms and microorganisms resistant to disinfectants aggravates the problem of combating the occurrence of nosocomial infections. This necessitates

compliance with the rules of disinfection, pre-sterilization cleaning, and sterilization.

There were shortcomings in the sterilization of dental instruments and materials (on average, the percentage of fulfillment of the criterion is 40%), and many dental offices did not have separate rooms for central sterilization. Most dentists do not have a dry-heat oven, and some institutions do not have an autoclave. The logbook for registering the receipt and issuance of instruments was not carried out correctly, and the sequence, the process of packing items, and the assembly of boxes was not observed.

According to the criterion "Medical waste management", the percentage of fulfillment of the criterion is 46.4%, in particular, in some institutions, when handling sharps waste, safety rules and sanitary standards are not observed. There is no system for sorting waste into appropriate containers.

Thus, from the above it follows that not all dental organizations understand the importance of knowledge and compliance with the basic requirements and measures for the prevention of infections associated with the provision of medical dental care to the population. Failure to comply with infection control and safety, sanitary and hygienic requirements, safety of medical procedures, stages of disinfection and sterilization, medical waste management, insufficient provision of disposable medical products and personal protective equipment creates a risk of transmission of bloodborne infection.

The results of the number of fulfilled assessment criteria for the state of infection control in percentage are presented in Table 2.

From Table 2 it can be seen that the total number of criteria and the total number of observed criteria are 25. The total number of executable IC criteria is from 9 to 15 criteria. As a result of the assessment sheet, it was found that the average percentage of compliance with infection control criteria in dental institutions of East Kazakhstan region and the Abay region is from 32% to 58%, with an average of 45%.

The percentage of fulfillment of the criteria is presented in Figure 1

Table 2.

Number of fulfilled assessment criteria for infection control status as a percentage.

№	Criteria indicators	Number and % of fulfillment of criteria by dental PH											Average meaning	
		A	B	C	D	E	F	G	H	I	J	K		
1	Total number of criteria	25	25	25	25	25	25	25	25	25	25	25	25	Average meaning
2	Total number of executables IC criteria	12	11	15	15	15	9	12	11	11	11	9		
3	Total number of observed IC criteria	25	25	25	25	25	25	25	25	25	25	25		
4	% fulfillment of IC criteria in public health	43%	45%	58%	58%	57%	37%	44%	44%	40%	40%	32%	45%	

Analysis of compliance with a set of hand hygiene measures showed no differences in organizations with and without problems in water supply ( $p = 0.303$ ). Among organizations that do not have problems with water supply, 57.1% ( $n=4$ ) comply with a set of hand hygiene measures, and 42.9% ( $n=4$ ) don't comply, while organizations with water supply problems 25% ( $n= 1$ ) try

to comply with a set of hand hygiene measures, and 75% ( $n=3$ ) don't comply.

Only 28.6% ( $n=2$ ) of the medical personnel of organizations, observing their own protection when receiving patients, take measures to protect the patients themselves, and 71.4% ( $n=5$ ) answered that they do not comply with measures to protect patients.

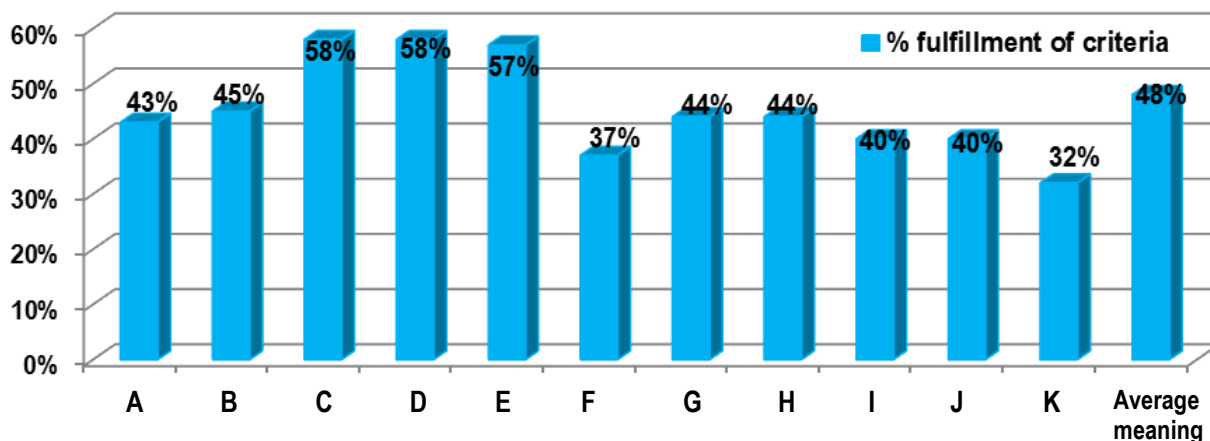


Figure 1. Percentage of fulfillment of criteria.

At the same time, 25% (n=1) of organizations that don't comply with the protection of medical personnel take measures to protect patients from infection, and 75% (n=3) do not take measures to protect patients, the differences are not statistically significant (p=0.898).

The connection between the implementation of measures to protect patients and compliance with general rules for disinfection and cleaning of instruments is presented in Table 3.

Table 3.

**The connection between the implementation of measures to protect patients and compliance with general rules for disinfection and cleaning of instruments**

		Compliance with general rules for disinfection and cleaning of instruments	
		Yes	No
Carrying out patient protection measures	Yes	Frequency	2
		%	25,0%
	No	Frequency	6
		%	75,0%

General rules for disinfection and cleaning of instruments are followed by 72.7% (n=8) of organizations and not followed by 27.3% (n=3) of organizations. At the same time, 75% (n=6) of organizations that comply with general rules for disinfection and cleaning of instruments do not take measures to protect patients (p=0.782).

The situation regarding compliance with sanitary and epidemiological control requirements is influenced by the presence of an infection control commission (ICC). In organizations where a ICC operates, 50% (n=3) of organizations take measures to protect patients from infection, and 50% (n=3) do not comply, while in organizations that do not have a ICC, 100% (n=5) do not take measures to protect patients from infection (p=0.064).

**Discussion**

Healthcare-associated infections (HCAI) are of great concern to patients and cause significant medical, social and economic harm. National and multicenter studies covering dozens of different countries have found that the incidence of patients with at least one nosological form of HCAI ranges from 3.5 to 12% [23].

In our study, according to the first criterion "Infection control and safety", deficiencies were identified in almost all dental institutions; on average, the fulfillment of the criterion is 54.5%.

Equally important for promoting the health of patients and staff in health care facilities are safe and sanitary conditions, which include the availability of good-quality water, hygiene, waste collection, disposal and disposal, as well as the availability of sufficient personal protective equipment. Low and middle-income countries estimate that 50% of sites do not have running water, 33% do not have adequate sanitation facilities, 39% do not have adequate infectious waste disposal facilities, 73% do not have sterilization equipment, and 59 % do not have a reliable power supply [13]. In our study, sanitary and hygienic requirements were met on average 52.3%. Because the area of dental offices does not meet hygienic requirements. Many dental facilities are in need of repairs (the paint on the walls is missing in places, the floors are worn out, the tiles are cracked).

In our study on the section "Disinfection and pre-sterilization cleaning of dental instruments, equipment and materials," the fulfillment of the criteria averaged 41% and 43.6%.

According to international experts, Lebanese dentists widely apply certain basic infection control measures, such as hand hygiene (90.1%), use of gloves (92.4%) and masks (89.1%), but poorly address other important issues such as such as occupational hazards, medical history, impression disinfection, hazardous dental waste disposal and handpiece sterilization, endodontic instruments and burs. This has resulted in low levels of overall compliance with infection control [9, 10, 11, 19]. In our study, when assessing the section "Safety of medical procedures," the following shortcomings were identified (on average, the percentage of fulfillment of the criterion is 41%): personal protective equipment (gloves, masks, goggles, puncture-resistant shoes), bibs and disposable napkins for patients are not used; rinse the mouth with an antiseptic.

In our study, the completion rate for sterilization of dental instruments and materials averages 40%. That is, most dental institutions do not have a dry-heat oven, and some institutions do not have an autoclave. All of the above can lead to an increase in the emergence of antibiotic-resistant organisms and microorganisms resistant to

disinfectants. This necessitates the choice of a rational method of disinfection and sterilization of instruments.

According to some researchers [16, 17, 18, 20] the risk of infection is underestimated by professionals despite the frequent occurrence of incidents involving cutting and piercing objects. Based on this, it is important to understand that the implementation of available preventive measures and effective preventive measures should be based on an individual analysis of the risk of infection. According to our study, the criterion "Medical waste management" was met only on average 46.4%, which means that in some institutions safety rules and sanitary standards are not followed when handling sharps waste.

### Conclusion

The study proves the need to strengthen measures to control infection safety in dental institutions. The average percentage of compliance with infection control criteria in dental settings was less than 50%.

According to the literature, this problem is observed not only in our country, but also in foreign countries. The risk of infection of persons involved in the provision of dental care with HIV, parenteral hepatitis and other blood-borne infections is not reduced. Particular attention should be paid to compliance with the requirements stipulated by regulatory documents, sanitary and hygienic requirements, safety rules when performing professional duties, compliance with manipulation algorithms, and work with medical waste.

From the above it follows that the conducted research of organizational, preventive and anti-epidemic measures made it possible to study and assess the state of anti-epidemic support, determine priorities for anti-epidemic activities and further improve the infection control system in dental organizations of the East Kazakhstan region and the Abay region to reduce the risk of infections associated with the provision of medical care, assistance in providing dental care to the population.

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