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RESEARCH ARTICLE

MEDICAL AND SOCIAL ASPECTS OF HEMOCONTACT INFECTIONS IN DENTAL INSTITUTIONS OF OSH REGION, KYRGYSTAN

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ABSTRACT

Background: Public health is at risk by the spread of hemocontact diseases such HIV, viral hepatitis B and C, especially in medical and dental facilities where rigorous infection control procedures are very essential. Transmitted via blood contact, these infections pose an extreme risk for patients undergoing dental treatment as well as for healthcare professionals as contact with blood and other fluids is frequent.

Objective: This research sought to assess the risk of infection among medical staff and patients at dental facilities in the Osh area of Kyrgyzstan as well as the frequency of infections passed via a hemocontact mechanism. To guarantee strong and multifaceted findings, a complete strategy combining epidemiological, analytical, sociological, laboratory, and statistical techniques was used.

Method: The study consisted of statistical, laboratory, social, and epidemiological techniques. Along with lab test findings, data sources included information on the incidence of HIV, HBV, and HCV (2020–2024) from the Osh Center for Disease Prevention. Developed to evaluate hygienic conditions, risk factors, and health awareness among 256 dentists, residents, and 220 dental students was a specifically customized questionnaire. Using MS Excel and Epi-Info tools, data were examined; the Student's t-test followed to determine statistical significance.

Result: The results showed that while viral hepatitis B, hepatitis C, and HIV are a significant public health problem, the epidemiological condition of hemocontact infections in the Osh region is still severe. Many times, dental offices overlook hygienic and epidemiological recommendations; disparities in infection control practices during patient treatment clearly increase the danger of viral spread. This risk is significantly increased by factors like poor sterilizing of tools, low compliance with infection safety guidelines, and holes in preventive precautions.

Conclusion: Strict use of a set of policies is very necessary to reduce the spread of hemocontact infections in dental treatment environments. This includes enforcing adherence to infection prevention and control criteria, enhancing monitoring systems, and guaranteeing thorough instruction for dental staff on infection safety methods. By closing these gaps, one may improve the safety of dental settings, therefore shielding patients from hemocontact infections as well as healthcare personnel.

***Keywords**:*Hemocontact infection, dental infection prevention, bloodborne disease epidemiology, healthcare-associated infections, sterilization and disinfection.

1.INTRODUCTION

Hemocontact infections (HCI), including viral hepatitis B (HBV), hepatitis C (HCV), and human immunodeficiency virus (HIV) are social and great economic interest implications because these diseases are 10 of the main causes of death from infectious diseases. The term blood ‘hemocontact containing

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infections' fluids, refers either to direct or indirect with blood or other bodily fluids. The incidence of HCI has grown over the past year in dentist clinics among other healthcare workplaces. Strict infection control policies and preventative techniques are desperately needed in healthcare contexts because patients, medical personnel, and medical students engaged in clinical practice run more risk of exposure [1].

One of the most often used healthcare treatments continues to be dental treatment. But the rising prevalence of blood-borne diseases such HIV, HBV, and HCV puts patients and dental professionals somewhat under concern. The potential spread of these diseases is facilitated by insufficient adherence to infection control policies in dentistry clinics.

The increased HIV pandemic, especially among high-risk populations like injecting drug users, has resulted in its spread in hospital environments including a confirmed outbreak among the juvenile population in Southern Kyrgyzstan. This scenario emphasizes the ongoing risk of hemocontact virus transmission in medical settings and calls for quick action to improve infection control policies in dentistry clinics [2].

Using the Osh area of the Kyrgyz Republic as a case study, this research intends to examine the frequency of hemocontact infections and evaluate the related infection risks among patients at dental facilities and healthcare staff.

The research aims to provide evidence-based suggestions for improving infection prevention strategies and preserving public health inside oral healthcare institutions by identifying areas of weakness in infection control procedures.

2.1 Study Design

The study aimed to identify the risk factors for hemocontact infections (HCI) at dental institutions, assess the awareness of infectious safety among dental professionals and students, and investigate the frequency of HCI among the Osh area of the Kyrgyz Republic population. Data were gathered and examined using a mix of social, epidemiological, laboratory, and statistical approaches.

2.2 Study Objects and Subjects

The research focused on dental groups comprising Osh State University academics majoring in dentistry, residents, practicing dentists, and students. The research included the degree of awareness on infectious safety, the results of a sociological survey on the risk factors for HCI infections at dental facilities, and the general frequency of HCI among the population.

2.3 MATERIAL AND METHODS

The study utilized several data sources to assess the incidence and prevalence of HCI in the Osh region:2.3.1 Add population Hepatitis B (HBV) and Hepatitis C (HCV) incidence statistics from the Osh Center for Disease Prevention and State Sanitary and Epidemiological Department for the years 2020–2024. 2.3.2 Results of laboratory tests for HBV and HCV carriers from Report Form No. 4-1, thereby illuminating the state of population infection status.2.3.3 Information on the status of HIV infection registration for the same time (2020–2024) gathered from the Osh Regional Center for the Prevention of Hemocontact Infections and HIV.**2.4 Survey Development**

A customized survey was designed to evaluate the knowledge level of dental professionals and students as well as to identify the risk factors of HCI infection in dental clinics. The survey consisted on three main sections: 2.4.1 Sanitary and Hygienic Conditions in Dental Clinics: Questions centered on the current safety guidelines, infection control policies, and hygienic practices used in dental establishments.

2.4.2 Risk Factors for HCI Infections: This part sought to find the general knowledge of dental staff on routes of transmission, preventative actions, and general awareness of the risk factors for infection with HCI viruses, including HIV, HBV, and HCV.

2.4.3 Self-Assessment of Health: The last half consisted of questions about personal health condition and participants' evaluation of their own risk of acquiring HCI viruses.

2.5 Study Population

The sample size consisted of 256 dentists and residents from dental clinics in the Osh area, as well as 220 students from Osh State University's "Dentistry" department in their fourth and fifth years. All participants were chosen based on their experience providing direct patient care in dental settings or participating in dental education.

2.6 Data Collection

At Osh State University's Department of "Public Health" and "Therapeutic Dentistry," the questionnaires were distributed to students during their free time outside of the usual course of instruction. Every participant signed a consent form, and the survey was carried out in line with ethical protocols.

2.7 Epidemiological Data

The infection burden in the region was assessed using epidemiological indicators, including the incidence of HBV, HCV, and HIV infections per 100,000 individuals and the prevalence of viral hepatitis markers (HBV and HCV) per 1,000 individuals examined.

2.8 Statistical Analysis

The Epi-Info software program and MS Excel were employed to process the sociological survey results, as well as the collected data on morbidity, HBV, and HCV carriers. The data was summarized using descriptive statistics, which included mean values (M±m). The validity and accuracy of the findings were guaranteed by evaluating the reliability of the results using the Student's t-test (t) and the error-free forecast criterion (P).

2.9 Ethical Statement

The principles of the Declaration of Helsinki were adhered to in the conduct of this investigation [3]. The IRB waived the requirement for ethical approval for the study, as all data were anonymized and collected in accordance with the ethical standards of observational research, owing to its retrospective nature. The study was conducted with the utmost confidentiality for all participants.

3.RESULTS AND DISCUSSION

Regarding hemocontact infections—more particularly viral hepatitis B and C-as well as HIV, the epidemiological condition in the Osh area of Kyrgyzstan still causes considerable concern. Transmitted via blood or blood-containing secretions, these diseases remain an immediate risk to the general community as well as to healthcare professionals [4]. The ongoing frequency of these diseases in the society, especially in dental environments, requires prompt attention to infection control strategies and preventative actions [5]. The Osh Center for Disease Prevention and State Sanitary and Epidemiological Supervision reports that HIV and viral hepatitis B and C are common in the region. These diseases are common in the general population and affect medical professionals, including dentists, who are at risk from blood exposure during operations. Table 1 shows the average yearly occurrence of various illnesses, underscoring the need for improved healthcare and community prevention. The annually registration of viral hepatitis B and C cases stresses the need to investigate epidemiological trends and risk factors. The research shows that the prevalence remains high across demographic categories, with medical staff, notably dentists, who typically operate in bloody conditions, being particularly vulnerable. Thus, strong infection control methods in dentistry clinics and other healthcare institutions are needed to reduce HCI spread.

Table 1. Dynamics of viral hepatitis incidence in Osh region (per 100 thousand population)

Year	Acute hepatitisT				Chronic hepatitisT			
	B		**C**		**B**		**C**	
	Indicator ±m Indicator	±m	Indicator ±m Indicator	±m	Indicator ± m Indicator	±m	Indicator ± m Indicator	±m
2020	1,7	±0,4	0,9	±0,22	34,2	±1,7	11,0	±09
2021	2,4	±0,4	0,4	±0,2	30,2	±1,6	10,8	±09
2022	2,7	±05	1,2	±0,3	33,9	±1,7	11,1	±09
2023	2,4	±0,4	1,9	±0,4	36,1	±1,6	12,6	±1,0
2024	1,7	±0,4	1,2	±0,4	39,4	±1,8	14,1	±1,1

Significant trends in the incidence of acute and chronic viral hepatitis B and C in the Osh area across the study's period are presented by the statistics shown in Table 1. Particularly, with an average of 1.7 ± 0.4 per 100,000 persons, the incidence of acute viral hepatitis B was very constant. From 0.9 ± 0.22 per 100,000 in 2020 to 1.2 ± 0.3 per 100,000 in 2024 ($p > 0.005$), the incidence of hepatitis C did, however, exhibit a clear rising trend. This spike in hepatitis C infections points to a worrying general load of this virus in the area. The chronic types of hepatitis also show this kind of tendency. Suggesting a larger long-term prevalence of chronic infection, the intense incidence rate of chronic hepatitis B considerably increased from 34.2 ± 1.7 per 100,000 in 2020 to 39.4 ± 1.8 per 100,000 in 2024 ($p < 0.005$). In same vein, the prevalence of chronic hepatitis C rose from 11.0 ± 0.9 in 2020 to 14.1 ± 1.1 per 100,000 in 2024. During the research period, the ratio between acute and chronic types of hepatitis shows significant new perspectives on the course and identification of these illnesses. Hepatitis B had a 1:12 acute to chronic case ratio; Hepatitis C had

a 1:9. The asymptomatic nature of acute hepatitis, often leading to delayed diagnosis and a higher incidence in the chronic phase, likely accounts for this discrepancy. Delayed awareness of acute hepatitis adds to the continuous spread of the illness as people stay ignorant of their infection and keep acting in ways that help the disease to spread. Apart from the general population trends, laboratory investigations revealed the pervasive existence of viral hepatitis markers among the general population as well as among medical professionals [6].

Table 2 shows that from 2020 and 2024, the general population's 1.5 times the incidence of hepatitis B shows increases. From 29.3 ± 0.8 in the year 2020 to 45.3 ± 1.1 in the year 2024, the frequency of chronic hepatitis B carriers per 1,000 persons climbed—a concerning rise ($p < 0.005$). This implies that, in spite of current public health campaigns meant to stop the hepatitis B virus, it is still transmitted constantly [7]. The incidence of hepatitis B and C symptoms did not vary substantially during the research period among healthcare staff members with a high occupational risk for hemocontact infections. The indications for Hepatitis B were about 19.7 ± 1.4 per 1,000 individuals in 2020, thereafter decreasing to 20.1 ± 1.4 in 2024. The prevalence of hepatitis C indicators remained stable, with a little increase from 10.7 ± 1.4 per 1,000 in 2020 to 11.2 ± 1.0 per 1,000 in 2024. The findings indicate that, despite the execution of infection control techniques like vaccination, the incidence of hepatitis B and C infections among healthcare personnel persists at a notably elevated level.

Moreover, among medical professionals, the incidence of hepatitis B and C is around 1.5 to 2 times less than in the general population ($p < 0.005$). This variation might be ascribed to the consistent use of immunization campaigns aimed at high-risk healthcare professionals and infection control measures [8 9].

Notwithstanding this lower frequency, the persistent presence of hepatitis markers among healthcare professionals emphasizes the need of continuous infection control strategies, including frequent screening, vaccination, and strict adherence to hygienic practices, to further lower the risk of transmission in healthcare environments [10].

Table 2. There areельonly a few markers of viral hepatitis B and C among the tested population, including medical personnel with a high occupational risk of infection in the Osh region (per 1000 examined people)

Years	InGY				VGC			
	Total population		Health workers		Total population		Health workers	
	Ad impressions Indicator	±m		±m	Ad impressions Indicator	±m		±m
2020	29,2	±0,8	19,7	±1,4	16,5	±06	10,7	±1,1
2021	34,9	±0,9	17,5	±1,3	20,1	±0,7	11,1	±1,0
2022	38,1	±1,0	15,9	±1,3	15,7	±0,6	10,0	±1,0
2023	43,3	±06	18,1	±1,2	14,1	±06	8,5	±09
2024	45,3	±1,1	20,1	±1,4	16,7	±0,7	11,2	±1,0

3.1 Epidemiological Situation of Hemocontact Infections in the Osh Region

The Osh region's epidemiological condition on hemocontact infections especially HIV remains alarming. Official statistics showing the overall number of HIV-infected people in the area as of January 1, 2024 show 1,006 (30.9%) cases linked to injectable drug users and 386 (11.9%) cases among children under 14 years of age. Two main periods—2002–2017, when injecting drug users were disproportionately affected due to the lack of adherence to precautionary measures during drug use; and 2007–2009, when a hospital outbreak resulted in HIV transmission among children in the healthcare facilities of the region—significantly contribute to the spread of HIV via the hemocontact route in the region. This continuous HIV pandemic draws attention to the stressful epidemiological setting for infectious illnesses spread in the Osh area via hemocontact pathways. Such illnesses are very common among the general population, which increases the danger of cross-contamination especially in medical facilities [11].

Given the nature of the operations involved, these establishments including dentistry offices have more chance of spreading among patients and staff. Particularly dental offices, the healthcare environment is classified as a high-risk place for the dissemination of hemocontact diseases like HIV, hepatitis, and other bloodborne viruses [12].

3.2 Growing Dental Care Infrastructure and Its Challenges

Kyrgyzstan's healthcare system, especially the dentistry field, has seen major changes over the last three decades that have resulted in a fast rise in the count of dental establishments. With a staffing ratio of 1.9 physicians and 3.3 secondary medical workers per 10,000 inhabitants, there are now nine state-run dental clinics in the Osh area and city manned by 310 doctors and over 540 medical professionals. The area also includes over 250 private dentistry offices, centers, and clinics. Although this growth has enhanced dental care availability, it has also presented certain difficulties for infection management. The number of dental offices has grown in line with changes in elements that help nosocomial infections—especially those spread by hemocontact—to proliferate. Dental offices naturally include treatments that expose one to bloodborne diseases, hence the lack of rigorous infection control policies increases the danger of transmission. Given the state of the region's healthcare system, which suffers notable flaws in infection control, this is especially alarming [13].

3.3 Infection Control Challenges in Dental Clinics

Examining infection control policies holistically throughout Osh region's dentistry offices finds various serious flaws and noncompliance. Six (66.6%) of the nine state dental offices in the area still occupy modified or converted buildings without centralized hot water supply systems, out of which The current water heaters are not adequate for the demand; many clinics lack centralized sanitation; only the dental clinics in Osh and Karasu districts have working centralized sewage systems. In some clinics, the water supply does not reach every part of the clinic and the sewage systems are sometimes local and inadequate [14]. Furthermore adding to a dangerous and hazardous working environment are numerous clinics without appropriate ventilation or inadequate maintenance of current systems. Furthermore, the actual locations of the dentist offices fall short of the necessary hygienic guidelines. Whether surgical, orthodontic, or general, the working space in dental offices is often insufficient. Many clinics provide just 9-10 square meters instead of the advised 14 square meters per workstation, therefore increasing the risk of cross-contamination and so compromising the general safety of patients and healthcare personnel. In dental environments, these architectural flaws and deviations from infection control procedures provide a substantial risk for the spread of infectious illnesses. This emphasizes how urgently better rules, control, and infrastructure changes are needed to stop hemocontact diseases from spreading among the dental clinics in the area [15].

3.4 Infection Control Deficiencies in Dental Clinics of Osh Region

A comprehensive assessment of Osh area dental clinic infection control policies has shown notable shortcomings in sterilizing procedures and hygienic standards compliance. Out of all the current dental offices, only three have centralized sterilizing departments completely compliant with legal requirements. On the other hand, most clinics (58.9%) run sterilizing facilities in specially designed rooms, where the current sterilizing tools are antiquated and frequently degraded due to wear and tear impacting around 35–40% of the equipment. Under 26.5% of cases, sterilization operations are contracted out to family medical centers and territorial hospital Central Sterilization Offices (CSOs). Nonetheless, an evaluation of these CSOs reveals that more than 52.2% of them fall short of the set Infection Control Regulations (ICR) regarding space requirements, industrial premises, and availability of current sterilizing equipment [16] .

The execution of strict anti-epidemic measures within working spaces determines much of the prevention of healthcare-associated infections (HAIs) in dentistry clinics. Still, following basic infection control guidelines is not perfect. Only 54.5% of instances saw pre-sterilization cleaning of medical devices and the use of disinfection and cleaning policies based on zoning concepts that is, separation of "clean" and "dirty" regions. With infractions recorded in up to 63.8% of the assessed institutions, the general non-compliance with hand hygiene standards among medical staff raises very alarming results. Many medical professionals showed poor understanding of correct hand washing methods and the appropriate antiseptic usage. Furthermore aggravating the danger of cross-contamination are the lack of basic items as disposable paper towels, cloth napkins, and antiseptic dispensers. The inadequate supply of personal protection equipment (PPE) is another important flaw noted in dentistry offices [17]. On a per-patient basis, medical staff members often lack necessary protective gear like disposable gloves, safety goggles, and waterproof aprons. This often leads to PPE reuse, which greatly raises disease transmission risk. Moreover, the absence of automated washing and disinfection devices in dental offices results in ongoing dependence on hand cleaning of used dental tools. Healthcare professionals who manually handle instruments run an occupational risk as pre-sterilization processes increase their contact to infectious pathogens [18].

Furthermore compromising the efficacy of infection control strategies in these facilities is the lack of current sterilizing technology like steam and low-temperature sterilization techniques. The results highlight how urgently sterilizing infrastructure has to be modernized and how closely infection control policies should be followed to guarantee patient and healthcare worker safety in dental clinics all over the Osh area. Examining dental clinics in the Osh area and their Dental Sterilization Services (DSS) has shown notable non-compliance with legal requirements. Deficiencies in terms of space and infrastructure, breaches of basic anti-epidemic criteria, inadequate artificial ventilation, and the lack of centralized hot water supply define the shortcomings. These elements undermine patient comfort and safety as well as medical staff working conditions. These flaws therefore provide an environment fit for the development of nosocomial infections (healthcare-associated infections, HAIs), including hemocontact diseases like viral hepatitis and HIV [19].

Of the dentists who responded, 56.4±3.1% said their health was "good," 21.6±2.5% said it was "satisfactory," and 12.0±2.0% said it was "poor." In addition, 75.2±2.6% of respondents said they were tired at the conclusion of their work shifts; 36.5±3.2% mentioned work overload; and 29.0±2.8% said rest intervals between patient visits were absent. The poll also showed that polyclinics lacked basic conveniences such rest spaces and facilities for physical activity. Strict attention to preventative actions is very essential considering the higher risk of HAIs in dental environments. Ensuring compliance with infection control policies depends critically on the awareness and understanding of dental healthcare professionals on the epidemiology, transmission, and prevention of HAIs. But a sociological research done among Osh State University's dentistry experts and students found gaps in knowledge and misunderstandings about infection safety. Although most dentists and residents (79.4±2.5%) and students (65.9±3.22%) showed correct knowledge of the main transmission routes of HIV and viral hepatitis B and C, a noteworthy proportion (21.6±2.6%) were unable to fairly evaluate infection risk. Unbelievably, 65.7±3.22% of students were ignorant about the availability of the hepatitis B vaccination and 42.5±3.44% lacked information on avoiding viral hepatitis B and C.

Though infection control training is very important, only 14.5±2.2% of the physicians polled had completed certified infection control courses over the preceding three years. Moreover, 49.2±3.1% said they have received instructions or training on infection control strategies at their places of employment. The main sources of knowledge on HAIs in dentistry differed among the respondents, which emphasizes the necessity of consistent teaching programs and strengthening of infection control practices within dental clinics.

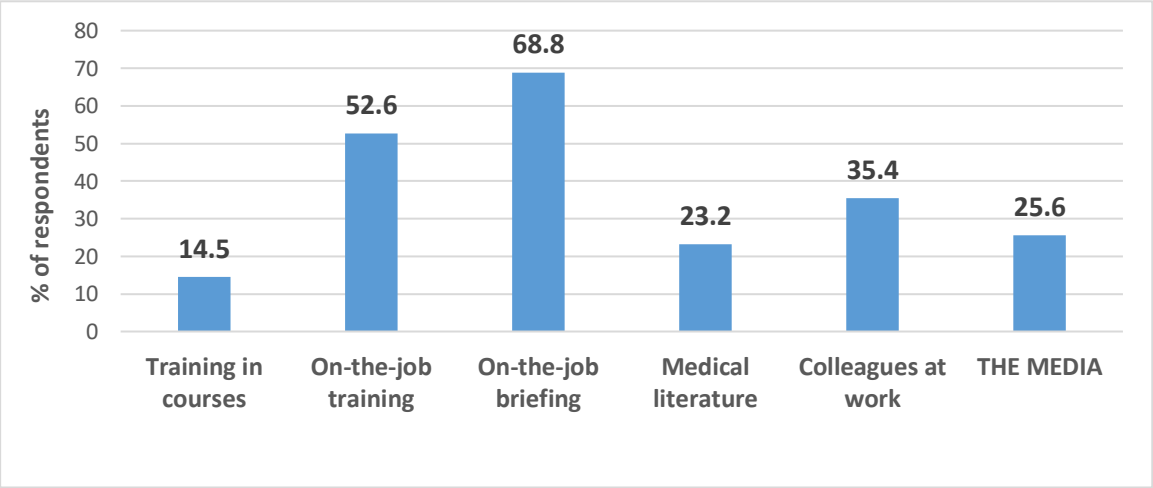

Figure 1.Answers to the question"Main sources of information on the epidemiology of GKI in dentistry"(in%)

Figure 1 shows that for most respondents, occupational-based training—including seminars and instructional courses—is the main source of knowledge about healthcare-associated infections (HAIs). But only a small percentage of workers (14.5±2.2%) said they had attended specialist seminars for recognized training, therefore exposing a discrepancy in official infection control instruction.

3.5 Concern and Challenges

Important markers of infection safety in dentistry offices are the condition of the working surroundings and the suitability of the tools. Among the respondents dentists and residents, 42.5±3.0% evaluated their working

circumstances as "good," 52.5±3.1% said they were "satisfactory," and 5.0±1.4% said they were "unsatisfactory." The respondents pointed out some issues with workplace organization. While 44.5±3.1% expressed inadequate workspace as a main issue, 30.5±2.8% of respondents said their work organization was ineffective. Furthermore noted by 32.4±2.9% of respondents as insufficient illumination levels and 25.6±2.7% as a contributing cause to less than ideal working conditions was poor ventilation. These results highlight the importance of bettering the physical surroundings of dental offices in order to improve infection control strategies. Ensuring a safer and more effective dental office environment depends on addressing these problems via improved infrastructure, well-designed workflow, and focused infection control training courses [20].

The expert will answer the question " The level of equipment of adental organization with dental and sterilization equipment, tools and materials. We received the following responses (Figure 2).

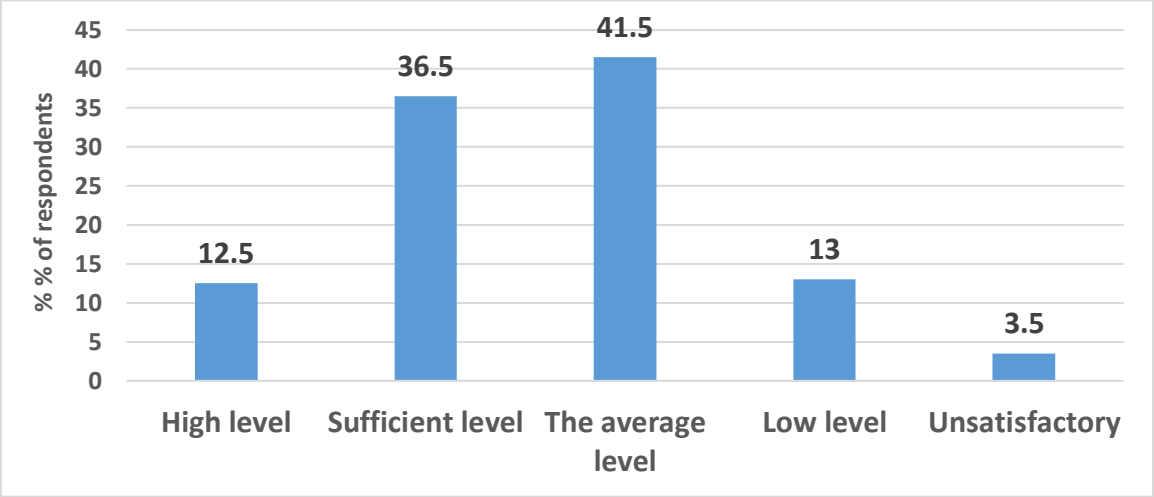

Figure 2 Assessment of the level of equipment of a dental organization (in %)

According to Figure 2, most of the respondents—78.0±2.6%—said their polyclinic's equipment satisfied minimum criteria. Some responders, however, voiced worries citing a "low level" or "unsatisfactory" equipment condition. Examining medical staff members' adherence to anti-epidemic policies during patient visits became the second step of the research. Preventing the spread of infectious disease pathogens to patients and medical staff depends critically on ensuring the safety of medical operations, the use of personal protective equipment (PPE), and hand hygiene practices. Figure 3 shows the results of the poll of dental institution workers about these features.

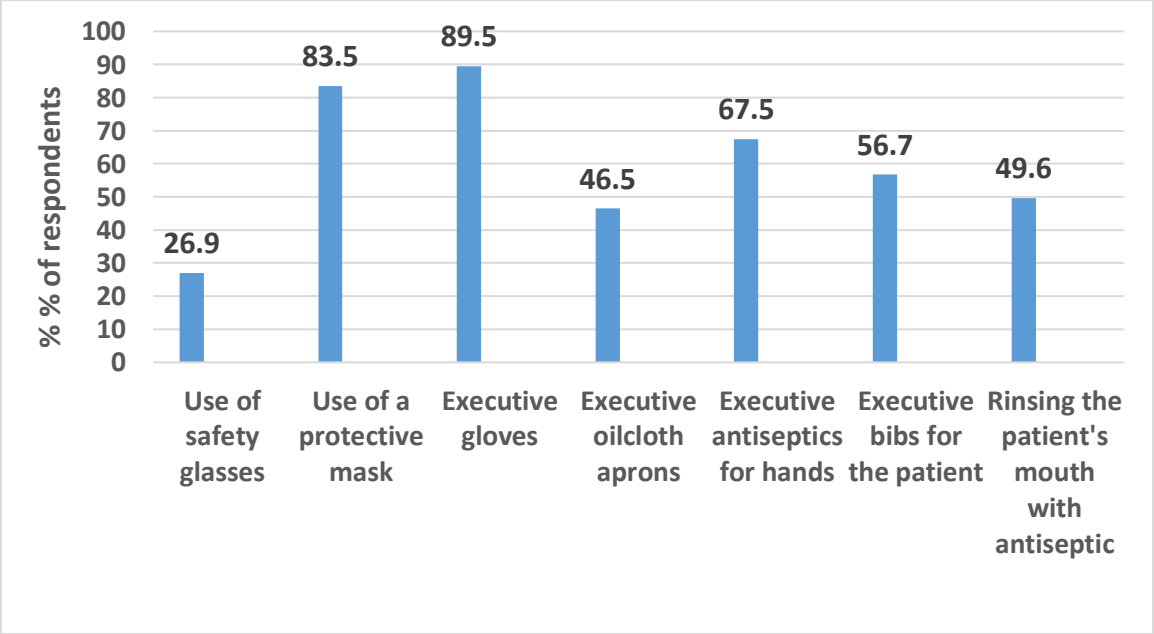

Figure 3. Results of a survey on the implementation of measures for the safety of medical manipulations in dental clinics.

As Figure 3 shows, although 16.5±2.3% of patients do not regularly utilize disposable masks while getting dental treatment, 83.5±2.3% of patients do. Furthermore, more than half of the respondents—73.1±2.7%—said they did not use protective goggles when providing patient treatment. Lack of availability, forgetfulness, or difficulty wearing masks or glasses are among the claimed causes. For the usage of aprons, antiseptics, and mouthwashes, a similar trend was seen. The poll results also showed that dental offices often neglect to follow hygienic and epidemiological guidelines, therefore violating infectious safety norms during patient contacts. Especially, 69.5±2.9% of clinicians never ask if their patients have viral hepatitis B or C. Furthermore, 34.5±3.0% of the physicians asked said they had varied degrees of skin damage or needle-stick events while working. These results show the great risk of hemocontact infections (HCIs) for patients and staff members of dental companies. Among the contributing causes are declining socioeconomic circumstances, inadequate financing for state medical facilities, and a dearth of contemporary sterilizing tools [21]. Furthermore, the limited resources and materials make it difficult to follow sanitary and anti-epidemic standards; meanwhile, poor understanding among medical staff on infection control aggravates the problem [22]. Thus, strict infection safety measures in dental offices must be followed and enforced in order to protect patients as well as medical staff [23].

5. CONCLUSION

the Osh region of the Kyrgyz Republic, the epidemiological represent concerns infectious diseases with a hemocontact transmission mechanism, including viral hepatitis B and C, as well as HIV, which continues to be a serious threat to public health. With numbers of 19.7±1.4 and 10.7±1.4 respectively, the data of 2020 to 2024 shows that the rates of hepatitis B (HBV) and C (HCV) among healthcare professionals have remained shockingly constant. These numbers show an ongoing risk with no improvement in lowering the transmission rates during this time. Furthermore under close consideration is the dentistry sector as regular breaches of approved hygienic and epidemiological guidelines occurs. Particularly in patient care, dental groups can neglect to follow infection safety procedures, thus increasing the danger of cross-contamination and hemocontact infection transmission, so compromising both medical staff and patients. Implementing a multifarious strategy to infection control is quite essential to meet these difficulties. This includes enhancing monitoring to pinpoint possible infection sources, funding contemporary sterilization and disinfection technology to guarantee the safety of medical equipment, and guaranteeing rigorous adherence to sanitary and anti-epidemic policies in dental offices. Furthermore important procedures to reduce the risk of transmission and protect the community as well as the healthcare personnel are improving control of infections and strengthening of the execution of preventive actions. These all-encompassing policies will help to lower the prevalence of certain avoidable diseases and enhance the general state of public health in the area.

DECLARATIONS

Ethical statement
This study was performed in line with the principles of the Declaration of Helsinki.

Consent statement
Due to the retrospective nature of the study, informed consent was waived

Data availability statement
Data will be made available on request.

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This research did not receive any specific funding.

Declaration of competing interest
The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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