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ЕЖЕМЕСЯЧНЫЙ НАУЧНЫЙ ЖУРНАЛ

Медицинские новости Грузии

საქართველოს სამედიცინო სიახლენი

GEORGIAN MEDICAL NEWS

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GMN: Georgian Medical News is peer-reviewed, published monthly journal committed to promoting the science and art of medicine and the betterment of public health, published by the GMN Editorial Board since 1994. GMN carries original scientific articles on medicine, biology and pharmacy, which are of experimental, theoretical and practical character; publishes original research, reviews, commentaries, editorials, essays, medical news, and correspondence in English and Russian.

GMN is indexed in MEDLINE, SCOPUS, PubMed and VINITI Russian Academy of Sciences. The full text content is available through EBSCO databases.

GMN: Медицинские новости Грузии - ежемесячный рецензируемый научный журнал, издаётся Редакционной коллегией с 1994 года на русском и английском языках в целях поддержки медицинской науки и улучшения здравоохранения. В журнале публикуются оригинальные научные статьи в области медицины, биологии и фармации, статьи обзорного характера, научные сообщения, новости медицины и здравоохранения. Журнал индексируется в MEDLINE, отражён в базе данных SCOPUS, PubMed и ВИНИТИ РАН. Полнотекстовые статьи журнала доступны через БД EBSCO.

GMN: Georgian Medical News – საქართველოს სამედიცინო სიახლენი – არის ყოველთვიური სამეცნიერო სამედიცინო რეცენზირებადი ჟურნალი, გამოიცემა 1994 წლიდან, წარმოადგენს სარედაქციო კოლეგიისა და აშშ-ის მეცნიერების, განათლების, ინდუსტრიის, ხელოვნებისა და ბუნებისმეტყველების საერთაშორისო აკადემიის ერთობლივ გამოცემას. GMN-ში რუსულ და ინგლისურ ენებზე ქვეყნდება ექსპერიმენტული, თეორიული და პრაქტიკული ხასიათის ორიგინალური სამეცნიერო სტატიები მედიცინის, ბიოლოგიისა და ფარმაციის სფეროში, მიმოხილვითი ხასიათის სტატიები.

ჟურნალი ინდექსირებულია MEDLINE-ის საერთაშორისო სისტემაში, ასახულია SCOPUS-ის, PubMed-ის და ВИНИТИ РАН-ის მონაცემთა ბაზებში. სტატიების სრული ტექსტი ხელმისაწვდომია EBSCO-ს მონაცემთა ბაზებიდან.

WEBSITE

www.geomednews.com

К СВЕДЕНИЮ АВТОРОВ!

При направлении статьи в редакцию необходимо соблюдать следующие правила:

1. Статья должна быть представлена в двух экземплярах, на русском или английском языках, напечатанная через **полтора интервала на одной стороне стандартного листа с шириной левого поля в три сантиметра**. Используемый компьютерный шрифт для текста на русском и английском языках - **Times New Roman** (**Кириллица**), для текста на грузинском языке следует использовать **AcadNusx.** Размер шрифта - **12**. К рукописи, напечатанной на компьютере, должен быть приложен CD со статьей.

2. Размер статьи должен быть не менее десяти и не более двадцати страниц машинописи, включая указатель литературы и резюме на английском, русском и грузинском языках.

3. В статье должны быть освещены актуальность данного материала, методы и результаты исследования и их обсуждение.

При представлении в печать научных экспериментальных работ авторы должны указывать вид и количество экспериментальных животных, применявшиеся методы обезболивания и усыпления (в ходе острых опытов).

4. К статье должны быть приложены краткое (на полстраницы) резюме на английском, русском и грузинском языках (включающее следующие разделы: цель исследования, материал и методы, результаты и заключение) и список ключевых слов (key words).

5. Таблицы необходимо представлять в печатной форме. Фотокопии не принимаются. **Все цифровые, итоговые и процентные данные в таблицах должны соответствовать таковым в тексте статьи**. Таблицы и графики должны быть озаглавлены.

6. Фотографии должны быть контрастными, фотокопии с рентгенограмм - в позитивном изображении. Рисунки, чертежи и диаграммы следует озаглавить, пронумеровать и вставить в соответствующее место текста **в tiff формате**.

В подписях к микрофотографиям следует указывать степень увеличения через окуляр или объектив и метод окраски или импрегнации срезов.

7. Фамилии отечественных авторов приводятся в оригинальной транскрипции.

8. При оформлении и направлении статей в журнал МНГ просим авторов соблюдать правила, изложенные в «Единых требованиях к рукописям, представляемым в биомедицинские журналы», принятых Международным комитетом редакторов медицинских журналов - http://www.spinesurgery.ru/files/publish.pdf и http://www.nlm.nih.gov/bsd/uniform_requirements.html
В конце каждой оригинальной статьи приводится библиографический список. В список литературы включаются все материалы, на которые имеются ссылки в тексте. Список составляется в алфавитном порядке и нумеруется. Литературный источник приводится на языке оригинала. В списке литературы сначала приводятся работы, написанные знаками грузинского алфавита, затем кириллицей и латиницей. Ссылки на цитируемые работы в тексте статьи даются в квадратных скобках в виде номера, соответствующего номеру данной работы в списке литературы. Большинство цитированных источников должны быть за последние 5-7 лет.

9. Для получения права на публикацию статья должна иметь от руководителя работы или учреждения визу и сопроводительное отношение, написанные или напечатанные на бланке и заверенные подписью и печатью.

10. В конце статьи должны быть подписи всех авторов, полностью приведены их фамилии, имена и отчества, указаны служебный и домашний номера телефонов и адреса или иные координаты. Количество авторов (соавторов) не должно превышать пяти человек.

11. Редакция оставляет за собой право сокращать и исправлять статьи. Корректура авторам не высылается, вся работа и сверка проводится по авторскому оригиналу.

12. Недопустимо направление в редакцию работ, представленных к печати в иных издательствах или опубликованных в других изданиях.

При нарушении указанных правил статьи не рассматриваются.

REQUIREMENTS

Please note, materials submitted to the Editorial Office Staff are supposed to meet the following requirements:

1. Articles must be provided with a double copy, in English or Russian languages and typed or compu-ter-printed on a single side of standard typing paper, with the left margin of **3** centimeters width, and **1.5** spacing between the lines, typeface - **Times New Roman** (**Cyrillic**), print size - **12** (referring to Georgian and Russian materials). With computer-printed texts please enclose a CD carrying the same file titled with Latin symbols.

2. Size of the article, including index and resume in English, Russian and Georgian languages must be at least 10 pages and not exceed the limit of 20 pages of typed or computer-printed text.

3. Submitted material must include a coverage of a topical subject, research methods, results, and review.

Authors of the scientific-research works must indicate the number of experimental biological species drawn in, list the employed methods of anesthetization and soporific means used during acute tests.

4. Articles must have a short (half page) abstract in English, Russian and Georgian (including the following sections: aim of study, material and methods, results and conclusions) and a list of key words.

5. Tables must be presented in an original typed or computer-printed form, instead of a photocopied version. **Numbers, totals, percentile data on the tables must coincide with those in the texts of the articles.** Tables and graphs must be headed.

6. Photographs are required to be contrasted and must be submitted with doubles. Please number each photograph with a pencil on its back, indicate author's name, title of the article (short version), and mark out its top and bottom parts. Drawings must be accurate, drafts and diagrams drawn in Indian ink (or black ink). Photocopies of the X-ray photographs must be presented in a positive image in **tiff format**.

Accurately numbered subtitles for each illustration must be listed on a separate sheet of paper. In the subtitles for the microphotographs please indicate the ocular and objective lens magnification power, method of coloring or impregnation of the microscopic sections (preparations).

7. Please indicate last names, first and middle initials of the native authors, present names and initials of the foreign authors in the transcription of the original language, enclose in parenthesis corresponding number under which the author is listed in the reference materials.

8. Please follow guidance offered to authors by The International Committee of Medical Journal Editors guidance in its Uniform Requirements for Manuscripts Submitted to Biomedical Journals publication available online at: http://www.nlm.nih.gov/bsd/uniform_requirements.html
http://www.icmje.org/urm_full.pdf
In GMN style for each work cited in the text, a bibliographic reference is given, and this is located at the end of the article under the title "References". All references cited in the text must be listed. The list of references should be arranged alphabetically and then numbered. References are numbered in the text [numbers in square brackets] and in the reference list and numbers are repeated throughout the text as needed. The bibliographic description is given in the language of publication (citations in Georgian script are followed by Cyrillic and Latin).

9. To obtain the rights of publication articles must be accompanied by a visa from the project instructor or the establishment, where the work has been performed, and a reference letter, both written or typed on a special signed form, certified by a stamp or a seal.

10. Articles must be signed by all of the authors at the end, and they must be provided with a list of full names, office and home phone numbers and addresses or other non-office locations where the authors could be reached. The number of the authors (co-authors) must not exceed the limit of 5 people.

11. Editorial Staff reserves the rights to cut down in size and correct the articles. Proof-sheets are not sent out to the authors. The entire editorial and collation work is performed according to the author's original text.

12. Sending in the works that have already been assigned to the press by other Editorial Staffs or have been printed by other publishers is not permissible.

Articles that Fail to Meet the Aforementioned Requirements are not Assigned to be Reviewed.

ავტორთა საყურადღებოდ!

რედაქციაში სტატიის წარმოდგენისას საჭიროა დავიცვათ შემდეგი წესები:

1. სტატია უნდა წარმოადგინოთ 2 ცალად, რუსულ ან ინგლისურ ენებზე,დაბეჭდილი სტანდარტული ფურცლის 1 გვერდზე, 3 სმ სიგანის მარცხენა ველისა და სტრიქონებს შორის 1,5 ინტერვალის დაცვით. გამოყენებული კომპიუტერული შრიფტი რუსულ და ინგლისურენოვან ტექსტებში - **Times New Roman (Кириллица)**, ხოლო ქართულენოვან ტექსტში საჭიროა გამოვიყენოთ **AcadNusx.** შრიფტის ზომა – 12. სტატიას თან უნდა ახლდეს CD სტატიით.

2. სტატიის მოცულობა არ უნდა შეადგენდეს 10 გვერდზე ნაკლებს და 20 გვერდზე მეტს ლიტერატურის სიის და რეზიუმეების (ინგლისურ, რუსულ და ქართულ ენებზე) ჩათვლით.

3. სტატიაში საჭიროა გაშუქდეს: საკითხის აქტუალობა; კვლევის მიზანი; საკვლევი მასალა და გამოყენებული მეთოდები; მიღებული შედეგები და მათი განსჯა. ექსპერიმენტული ხასიათის სტატიების წარმოდგენისას ავტორებმა უნდა მიუთითონ საექსპერიმენტო ცხოველების სახეობა და რაოდენობა; გაუტკივარებისა და დაძინების მეთოდები (მწვავე ცდების პირობებში).

4. სტატიას თან უნდა ახლდეს რეზიუმე ინგლისურ, რუსულ და ქართულ ენებზე არანაკლებ ნახევარი გვერდის მოცულობისა (სათაურის, ავტორების, დაწესებულების მითითებით და უნდა შეიცავდეს შემდეგ განყოფილებებს: მიზანი, მასალა და მეთოდები, შედეგები და დასკვნები; ტექსტუალური ნაწილი არ უნდა იყოს 15 სტრიქონზე ნაკლები) და საკვანძო სიტყვების ჩამონათვალი (key words).

5. ცხრილები საჭიროა წარმოადგინოთ ნაბეჭდი სახით. ყველა ციფრული, შემაჯამებელი და პროცენტული მონაცემები უნდა შეესაბამებოდეს ტექსტში მოყვანილს.

6. ფოტოსურათები უნდა იყოს კონტრასტული; სურათები, ნახაზები, დიაგრამები - დასათაურებული, დანომრილი და სათანადო ადგილას ჩასმული. რენტგენოგრამების ფოტოასლები წარმოადგინეთ პოზიტიური გამოსახულებით **tiff** ფორმატში. მიკროფოტოსურათების წარწერებში საჭიროა მიუთითოთ ოკულარის ან ობიექტივის საშუალებით გადიდების ხარისხი, ანათალების შეღებვის ან იმპრეგნაციის მეთოდი და აღნიშნოთ სურათის ზედა და ქვედა ნაწილები.

7. სამამულო ავტორების გვარები სტატიაში აღინიშნება ინიციალების თანდართვით, უცხოურისა – უცხოური ტრანსკრიპციით.

8. სტატიას თან უნდა ახლდეს ავტორის მიერ გამოყენებული სამამულო და უცხოური შრომების ბიბლიოგრაფიული სია (ბოლო 5-8 წლის სიღრმით). ანბანური წყობით წარმოდგენილ ბიბლიოგრაფიულ სიაში მიუთითეთ ჯერ სამამულო, შემდეგ უცხოელი ავტორები (გვარი, ინიციალები, სტატიის სათაური, ჟურნალის დასახელება, გამოცემის ადგილი, წელი, ჟურნალის №, პირველი და ბოლო გვერდები). მონოგრაფიის შემთხვევაში მიუთითეთ გამოცემის წელი, ადგილი და გვერდების საერთო რაოდენობა. ტექსტში კვადრატულ ფჩხილებში უნდა მიუთითოთ ავტორის შესაბამისი N ლიტერატურის სიის მიხედვით. მიზანშეწონილია, რომ ციტირებული წყაროების უმეტესი ნაწილი იყოს 5-6 წლის სიღრმის.

9. სტატიას თან უნდა ახლდეს: ა) დაწესებულების ან სამეცნიერო ხელმძღვანელის წარდგინება, დამოწმებული ხელმოწერითა და ბეჭდით; ბ) დარგის სპეციალისტის დამოწმებული რეცენზია, რომელშიც მითითებული იქნება საკითხის აქტუალობა, მასალის საკმაობა, მეთოდის სანდოობა, შედეგების სამეცნიერო-პრაქტიკული მნიშვნელობა.

10. სტატიის ბოლოს საჭიროა ყველა ავტორის ხელმოწერა, რომელთა რაოდენობა არ უნდა აღემატებოდეს 5-ს.

11. რედაქცია იტოვებს უფლებას შეასწოროს სტატია. ტექსტზე მუშაობა და შეჯერება ხდება საავტორო ორიგინალის მიხედვით.

12. დაუშვებელია რედაქციაში ისეთი სტატიის წარდგენა, რომელიც დასაბეჭდად წარდგენილი იყო სხვა რედაქციაში ან გამოქვეყნებული იყო სხვა გამოცემებში.

აღნიშნული წესების დარღვევის შემთხვევაში სტატიები არ განიხილება.

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ASSESSMENT OF INFECTIOUS DISEASE RISK FACTORS, INCLUDING COVID-19, AMONG HEALTHCARE WORKERS IN EAST KAZAKHSTAN REGION

Tolegenova Z.Zh[1], Tokanova Sh.E[1], Baibussinova A.Zh[1], Kalikhanova K[1], Iskakova A.M[1], Shalgumbayeva G.M[1].

[1]*Semey medical university, Semey, Kazakhstan.*

Abstract.

Background: Healthcare-related infections (HCRI) remain a major global concern, especially in dentistry, where exposure to saliva, blood, and aerosols increases the risk of cross-infection. The COVID-19 pandemic underscored the vulnerability of dental professionals to airborne pathogens, prompting stricter protocols such as enhanced PPE and ventilation. However, challenges remain due to limited biosafety knowledge and inconsistent preventive practices.

Aim of Study: This investigation aimed to assess the risk factors associated with infectious disease transmission, including COVID-19, among healthcare personnel during dental care in the East Kazakhstan region.

Material and Methods: We studied following variables: socio-demographic characteristics; reason, time, circumstances and kind of trauma in the work place; documentation for recording of occupational injury; knowledge and attitudes about the measures of prevention and control transmission infection during performing of work. Pearson chi-squared was used for qualitative data. Bivariate analysis was done to determine the relationship between injured of the skin while performing professional duties and the independent variables.

Results: The age group mostly was presented by age 41-50 years (37,9%). Middle work experience was 6-10 years (29,6%). Most of the participants have had injured of the skin while performing professional duties 82,9% men and 89,0% women. The nature of most of the injuries was getting the patient's blood on the skin (38,2%), and getting piercing the skin with a sharp tool (31,5%). The most frequent accidents in their practice occurred due to non-use barriers 48,7% of men and 33,1% of women.

Conclusions: Preventive measures in the work of the dentist in the study region need to improvement. The most frequent accidents in their practice occurred due to non-use barriers.

Key words. Dentistry, infection, HIV, Hepatitis, COVID-19, Kazakhstan.

Introduction.

Healthcare-related infections (HCRI) remain the most common adverse events associated with medical care worldwide, despite growing awareness of their impact and increasing implementation of preventive strategies. Every year, millions of patients are affected by these infections, significantly compromising patient safety, contributing to increased morbidity and mortality, and reducing overall quality of life [1].

Within the healthcare system, dental settings are among the most contamination-prone environments. This is largely due to the high microbial load present in the oral cavity, which serves as a reservoir for a wide range of infectious agents [2]. Infection control protocols are therefore essential in preventing the transmission of pathogens via saliva, blood, aerosols, or water during dental procedures [3].

Dental instruments are often categorized as critical or semi-critical due to their frequent contact with mucosal surfaces or gingival tissues, which increases the potential for cross-contamination [4]. Moreover, accidental injuries during procedures, such as needlestick or sharp instrument injuries, further elevate the risk of infection transmission [5]. As a result, fostering a safety-focused work environment and rigorous adherence to infection control protocols is crucial among dental professionals.

The emergence and global spread of COVID-19 highlighted the vulnerability of dental professionals and patients to airborne infections, particularly in environments involving aerosol-generating procedures [6] Dental settings were identified as high-risk zones for SARS-CoV-2 transmission due to close face-to-face contact, exposure to respiratory droplets, and limited ventilation [7]. This pandemic significantly reshaped infection prevention protocols in dentistry, emphasizing the importance of enhanced personal protective equipment (PPE), improved air filtration, and strict screening protocols [8].

Promoting awareness, biosecurity practices, and consistent application of infection prevention measures is vital for ensuring both patient and healthcare worker safety - not only for traditionally known bloodborne pathogens but also for emerging airborne threats like SARS-CoV-2 [9,10].

Identifying exposure risks and understanding how infections spread in dental settings is critical to developing effective healthcare strategies, especially for protecting dental professionals [11]. Reports indicate that over 20% of dentists have experienced needlestick injuries, which are major risk factors for the transmission of bloodborne pathogens such as HIV, hepatitis B, hepatitis C, and tuberculosis [12].

Evidence suggests that dentists face increased occupational risk due to frequent contact with blood and bodily fluids. Inadequate knowledge of biosafety protocols and inconsistent adherence to infection control practices have been observed in some dental professionals, further compounding this risk [13]. The physical constraints of the dental environment, including limited working space and sudden movements by patients or practitioners, contribute to accidental injuries during procedures [14,15].

Therefore, the aim of this study is to investigate the risk factors associated with infectious disease transmission, including COVID-19, among healthcare personnel during dental care in the East Kazakhstan region.

Materials and Methods.

The study was a cross-sectional survey of medical workers of dental clinics in East Kazakhstan region in 2023. The study population was 1650, which is the total medical workers in dental clinics of East-Kazakhstan. Using a sample size calculator, it was estimated that a minimum of 192 workers in dental clinics should be sampled in order to gain a 95%confidence level, with a maximum allowable difference of 0.05. A complete list of registered dental healthcare professionals in East Kazakhstan was obtained from the regional health department. Participants were then selected using simple random sampling via a computer-generated random number list, thus a total of 203 medical workers of dental clinics were surveyed for this study. The questionnaire was independently developed in alignment with international research [16,17] and expertise, and it underwent a validation procedure. The questionnaire used in the current study was adapted from the study (Silva, Oscar, et al., 2018), then translated into Kazakh and Russian. In order to provide the correctness of the translation, the questionnaire was translated from Kazakh and Russian into English and juxtaposed with the initial edition. The questionnaire contains 34 questions, which were divided into different section. The first section included socio-demographic characteristics such as gender, age group, work experience, work place, and job title. The second part included questions about the reason, time, circumstances and kind of trauma in the work place. The third part included questions about documentation for recording of occupational injury. The last section included knowledge and attitudes about the measures of prevention and control transmission infection during performing of work. A list of possible responses to each question was given and respondents were invited to choose the answer that best fitted their attitude and circled only one category. The questionnaire was fully piloted and refined for clarity before being issued. The data was collected by a face-to-face interview of all participants. Informed consent was taken before participation in the study. Institutional Ethical Committee clearance was taken before the study (Semey Medical University Ethics Committee, Protocol №5, January 25, 2022).

Statistical processing of the study results was carried out using descriptive statistics. The choice of statistical criteria for data analysis depended on the type of variables being analyzed. Pearson chi-squared was used for qualitative data. Statistical analysis was performed using SPSS version 20.0 (IBM Ireland Product Distribution Limited, Ireland). The level of statistical significance was set at $p<0.05$. Bivariate analysis was done to determine the relationship between injured of the skin while performing professional duties and the independent variables. Variables with p-value less than 0.2 were included in the multivariate analysis. After removal of variables with high collinearity, a step-backward approach was used to construct the final model. Only those variables with p-value less than 0.05 were retained.

Results and Discussion.

The study sample included 203 respondents who agreed to take participation in a sociological survey. The demographic characteristics are presented on the Table 1. Mean age of participants was 40,9 (±8,48) years, the youngest of them was 25 years and the eldest was 57 years. Age group mostly was presented by age 41-50 years (37,9%) and 31-40 years (32,0%). Mean work experience was 11,0 (±6,24) years, minimum work experience was 1-year, maximum work experience was 26 years. Less than half of respondents work in Private dental clinic. Mostly it was general dentist (18,7%) and dental therapist (19,2%) (Table 1).

In Kazakhstan, in surgical dentistry traditionally work men, while women are more often employed in therapeutic dentistry, therefore, the groups were divided by gender. The questionnaire on the assessment of Infection Control Measures in Stomatology workers is presented on the Table 2.

Specialists of both sexes have had injured of the skin while performing professional duties 82,9% and 89,0% accordingly. Nature of most of the injuries at male mainly was getting the patient's blood on the skin (38,2%), at women mainly was getting piercing the skin with a sharp tool (31,5%). The most frequent accidents in practice occurred due to non-using of barriers (bathrobe, gloves, glasses or plastic shields) 48,7% of men and 33,1% of women. Many dentists have noted the absence of an incident registration log for recording healthcare worker injuries at the workplace 59,2% of men and 74,8% of women. The most of male 65,8% and 75,6% of female answered that the last injury was not recorded in a logbook.

The possibility to get ill with infection diseases during the performance of their work is presented on the Table 3.

The stomatology workers of both sexes think that they have the risk of HIV transmission during the work performing in 1%-10% according to the answers of 35,5% male respondents, and in 10%-30% according to the answers of 36,2% female respondents, the risk of Hepatitis B transmission in 30%-50% according to the answers of 39,5% male respondents and 44,9% female respondents, the risk of Hepatitis C transmission in 10%-30% according to the answers of 40,8% male respondents, and 30%-50 according to the answers of 40,2% female respondents. More than half of both male (55.2%) and female (58.4%) respondents perceived the risk of COVID-19 transmission to the dentist during treatment as high. None of the respondents believed the risk to be less than 1%.

The result of bivariate analysis of the relationship between injured of the skin while performing professional duties and the independent variables is presented on the Table 4.

The dental workers who are aged up to 30 years have in 0.136 the likelihood of reporting injury is diminished (OR = 0.136, 95% CI: 0.033-0.568, p=0.006) in comparison to the reference group (aged 50 and older). Regarding workplace, working in a state dental clinic was associated with a significantly higher risk of injuries (OR=10.303, 95% CI: 1.320–80.408, p=0.026), relative to private clinics. For gender, males had a lower likelihood of reporting injuries compared to females (OR = 0.600, 95% CI: 0.266–1.357, p = 0.220); however, this difference was not statistically significant. Personnel with up to 5 years of work experience had significantly lower odds of injury (OR = 0.184, 95% CI: 0.047–0.717, p = 0.015) compared to those with more than 16 years of experience. Compared to general dentists, none of the other job categories showed statistically significant

Table 1. *Participant Characteristics (n=203).*

	Characteristics	n	%
Gender			
	Male	76	37,4
	Female	127	62,6
Age groups			
	25-30 years	25	12,3
	31-40 years	65	32,0
	41-50 years	77	37,9
	51-57 years	36	17,7
Work experience			
	Up to 5 years	40	19,7
	6-10 years	60	29,6
	11-15 years	57	28,1
	over 16 years	46	22,7
Work place			
	Private dental clinic	83	40,9
	Dental offices of the multidisciplinary polyclinic	37	18,2
	State dental clinic	41	20,2
	District Dental Clinic	27	13,3
	University Hospital of Semey Medical University	15	7,4
Job title			
	General dentist	38	18,7
	Dental therapist	39	19,2
	Orthopedic dentist	22	10,8
	Dental Surgeon	27	13,3
	The maxillofacial surgeon	8	3,9
	Dentist-orthodontist	10	4,9
	Pediatric dentist	12	5,9
	Dentist	9	4,4
	Nurses	19	9,4
	Sanitary workers	19	9,4

Table 2. *Infection Control Measures in Stomatology workers.*

Question	Answer	Gender		p
		Male, n (%)	Female, n (%)	
Have you ever had injured of the skin while performing professional duties?	Yes	63 (82,9)	113 (89,0)	0,170
	Not	9 (11,8)	6 (4,7)	
	I don’t remember	4 (5,3)	8 (6,3)	
What was the nature of most of the injuries?	Getting the patient's blood on the skin	29 (38,2)	24 (18,9)	0,011
	Piercing the skin with a sharp tool	17 (22,4)	40 (31,5)	
	Skin cut with a sharp tool	12 (15,8)	35 (27,6)	
	The ingress of blood (other biological fluid) on the mucous membranes of the eye, nose, mouth	18 (23,7)	28 (22,0)	
The most frequent accidents in your practice occurred in the following circumstances	Non-compliance with safety rules when working with sharp tools and biomaterial	16 (21,1)	35 (27,6)	0,072
	Non-use of barriers (bathrobe, gloves, glasses or plastic shields)	37 (48,7)	42 (33,1)	
	Non-compliance with standards of procedure technology	16 (21,1)	22 (17,3)	
	Medical waste management	4 (5,3)	12 (9,4)	
	Processing of medical instruments	2 (2,6)	15 (11,8)	
	Did not have	1 (1,3)	1 (0,8)	

Is there a log of emergencies, injuries to medical staff?	Yes	31 (40,8)	32 (25,2)	0,028
	Not	45 (59,2)	95 (74,8)	
Was the last injury you sustained recorded in a logbook?	Yes	26 (34,2)	31 (24,4)	0,148
	Not	50 (65,8)	96 (75,6)	
Have you ever received education, training or detailed instruction on the safe handling of sharp medical instruments and the prevention of occupational exposure in the workplace?	Yes	62 (81,6)	98 (77,2)	0,456
	Not	14 (18,4)	29 (22,8)	

Table 3. *The possibility to get ill with infection diseases, including COVID-19 during the performing of work.*

Question	**Answer**	**Gender**		**p**
		Male, n (%)	**Female, n (%)**	
What is the risk of HIV, transmission to the dentist during the work performed?	Less than 1%	8 (10,5)	9 (7,1)	0.132
	1%-10%	27 (35,5)	32 (25,2)	
	11%-30%	26 (34,2)	46 (36,2)	
	31%-50%	7 (9,2)	28 (22,0)	
	51%-95%	8 (10,5)	12 (9,4)	
What is the risk of Hepatitis B transmission to the dentist during the work performed?	Less than 1%	5 (6,6)	7 (5,5)	0.314
	1%-10%	11 (14,5)	8 (6,3)	
	11%-30%	15 (19,7)	22 (17,3)	
	31%-50%	30 (39,5)	57 (44,9)	
	51%-95%	15 (19,7)	33 (26,0)	
What is the risk of Hepatitis C transmission to the dentist during the work performed?	Less than 1%	6 (7,9)	7 (5,5)	0.130
	1%-10%	9 (11,8)	7 (5,5)	
	11%-30%	31 (40,8)	41 (32,3)	
	31%-50%	19 (25,0)	51 (40,2)	
	51%-95%	11 (14,5)	21 (16,5)	
What is the risk of COVID-19 transmission to the dentist during the work performed?	Less than 1%	0 (0%)	0 (0%)	0.090
	1%-10%	3 (3.9%)	4 (2.8%)	
	11%-30%	12 (15.8%)	18 (14.1%)	
	31%-50%	19 (25.1%)	31 (24.7%)	
	51%-95%	42 (55.2%)	74 (58.4%)	

Table 4. *Multivariate analysis associated with injured of the skin while performing professional duties.*

Variables	**Positive history of skin injuring**				
		Odd ratio	**Standard error**	**P-value**	**CI 95%**
Age (years)	Up to 30 years	0.136	0.728	0.006	0.033-0.568
	31-40 years	1.091	0.762	0.909	0.245-4.855
	41-50 years	0.687	0.700	0.591	0.174-2.706
	older than age 50				Reference
Gender	Male	0.600	0.416	0.220	0.266-1.357
	Female				Reference
Work experience	Up to 5 years	0.184	0.694	0.015	0.047-0.717
	6-10 years	0.453	0.708	0.264	0.113-1.815
	11-15 years	0.726	0.759	0.672	0.164-3.211
	over 16 years				Reference
Work place	Private dental clinic				Reference
	Dental offices of the multidisciplinary polyclinic	1.648	0.552	0.366	0.558-4.868
	State dental clinic	10.303	1.048	0.026	1.320-80.408
	District Dental Clinic	1.481	0.606	0.517	0.451-4.859
	University Hospital of Semey Medical University	0.044	0.018	0.881	0.009-0.822

Job title	General dentist				Reference
	Dental therapist	1.467	0.596	0.521	0.456-4.717
	Orthopedic dentist	1.200	0.681	0.789	0.316-4.560
	Dental Surgeon	1.533	0.672	0.525	0.411-5.725
	The maxillofacial surgeon	0.319	1.161	0.326	0.033-3.112
	Dentist-orthodontist	2.400	1.127	0.437	0.264-21.840
	Pediatric dentist	1.333	0.871	0.741	0.242-7.348
	Dentist	2.133	1.133	0.504	0.232-19.649
	Nurses	0.444	1.477	0.583	0.025-8.031
	Sanitary workers	4.800	1.102	0.155	0.554-41.597

associations with skin injury risk. Although sanitary workers had higher odds (OR = 4.800, p = 0.155), the wide confidence interval (0.554–41.597) and non-significant p-value indicate no reliable association.

Healthcare workers in the dental field face an elevated risk of occupational exposure to different infections. These risks are heightened due to regular contact with the saliva and blood of infected patients and continuous handling of sharp, contaminated medical instruments. Therefore, the physician should regard every patient as potentially carrying an infection. By adhering to this principle, the likelihood of infection can be significantly minimized. Within the dental field, this represents a significant benefit achieved through the expertise and conscientiousness of the healthcare team. Hence, all endeavors should be focused on preventive measures. The aim of this study was to assess the knowledge, attitudes, and practices related to infection control measures among dentists East Kazakhstan region.

Stomatologists are at great risk of cross infection, as they are exposed to patients. Dental personnel today face multiple risk factors that can result in the transmission of numerous diseases via various fluids, including saliva and blood. The World Health Organization (WHO) has highlighted the importance of occupational health and safety for healthcare workers [18].

Their reports emphasize the global impact of work-related injuries and illnesses in the healthcare sector, urging countries to implement measures to protect healthcare professionals. This is particularly concerning when it comes to hepatitis B and HIV, which are significant public health challenges. Several factors will have a direct influence on the knowledge, attitudes, and practices of dental personnel when it comes to caring for patients with infectious diseases. Therefore, it is crucial for medical staff should follow to infection safety that enhances the quality of patient care and reduces the occurrence of cross infections in dental practices. According to our investigation 82,9% of male 89,0% women medical workers have had injured of the skin while performing professional duties.

Our findings indicate that the nature of occupational injuries differs between male and female dental personnel. Men were more frequently injured through contact with patients' blood on the skin (38.2%), while women more commonly experienced skin-piercing injuries caused by sharp instruments (31.5%). While this was initially attributed to the traditional division of labor - where men are more often involved in surgical procedures and women in conservative dental treatments - a deeper analysis reveals that these differences likely stem from the distinct nature of job responsibilities. Surgical procedures, typically involving higher volumes of blood and more invasive interventions, increase the risk of exposure to bloodborne pathogens. Men may be overrepresented in such roles due to institutional or cultural norms. Conversely, women more frequently perform routine therapeutic dental care, which requires repeated handling of needles, scalpels, and other sharp instruments in confined oral spaces, thereby increasing the likelihood of needlestick injuries. These role-based distinctions highlight the need to tailor occupational safety strategies to specific job functions and ensure that both training and protective measures address the actual risks encountered by different subgroups within the dental workforce.

The International Labour Organization (ILO) has conducted extensive research on occupational safety and health, including within the healthcare sector. Their findings highlight the importance of comprehensive safety programs, ongoing training, and consistent use of personal protective equipment (PPE) to reduce the risk of workplace injuries [19].

In our study, respondents indicated that the most frequent accidents in their practice were associated with the failure to use protective barriers such as gowns, gloves, goggles, or face shields. This was reported by 48.7% of men and 33.1% of women. Despite this, nearly all participants noted the absence of a dedicated logbook for documenting occupational injuries, and confirmed that their most recent injury had not been officially recorded. Interestingly, 81.6% of male and 77.2% of female respondents reported having received education, training, or detailed instruction on the safe handling of sharp instruments and the prevention of occupational exposure in the workplace.

These findings point to a notable knowledge-behavior gap, wherein awareness of safety protocols does not consistently translate into protective practices. Several factors may contribute to this discrepancy. First, demanding workloads and time constraints may lead to intentional or unintentional neglect of safety measures. Second, limited availability or poor quality of PPE, especially in resource-constrained settings, can hinder consistent usage. Third, repeated exposure to similar clinical environments may lead to the normalization of risk, resulting in an underestimation of hazards and complacency in applying standard precautions.

Therefore, while safety education remains a critical component of injury prevention strategies, it is likely insufficient on its own. Addressing the behavioral and systemic barriers to PPE compliance - such as improving PPE access, reinforcing institutional safety culture, and implementing monitoring systems like injury logbooks - is essential to reduce the incidence of occupational injuries in healthcare settings.

Dental professionals, like other healthcare providers, face a recognized hazard of potential exposure to bloodborne pathogens such as the Human Immunodeficiency Virus (HIV), hepatitis B virus (HBV), and hepatitis C virus (HCV), COVID-19 [20-22]. Dentistry is widely perceived by both professionals and much of the general public as posing significant risks. Potential infection risks include transmission through needles, sharp instruments, splatter, and aerosols [23,24]. These infections may include serious viral diseases such as acquired immunodeficiency syndrome (AIDS) and hepatitis B, as well as bacterial infections [25-28]. According to our research 35,5% of male participants the risk of HIV transmission to the dentist during the work performed could be in 1%-10% and 36,2% of women respondents think there is such a risk in10%-30%.

An examination of the occurrence rates of hepatitis B, C, and D revealed a significant surge in new cases in Kazakhstan between 2015 and 2020. Scientists indicate that viral hepatitis remains problem for public health in Kazakhstan and the Central Asian region. The increase in the number of dental clinics, as indicated in earlier studies, due to not the imperfect sterilization can also contribute to an increase in infection with viral hepatitis B and C [29]. According to our investigation 39,5% of male participants the risk of Hepatitis B transmission to the dentist during the work performed could be in 30%-50% and 44,9% of women respondents think there is such a risk also in 30%-50%. And 40,8% of male participants the risk of Hepatitis C transmission to the dentist during the work performed could be in 10%-30% and 40,2% of women respondents think there is such a risk in 30%-50%. Our investigation noted that males had a lower likelihood of experiencing injuries compared to female medical workers (OR=0.600, 95% CI: 0.266–1.357, p=0.220); however, this association was not statistically significant. And therefore this factor increase possibility of transmission many infections.

Our survey results showed that more than half of both male (55.2%) and female (58.4%) dental professionals in East Kazakhstan perceive the risk of COVID-19 transmission during dental care as high (51 - 95%), and none rated it below 1%. These findings reflect a heightened awareness among dentists of their occupational vulnerability to SARS-CoV-2.

This perception aligns closely with large-scale international studies. For example, a global survey involving 52,491 dental professionals across 36 countries conducted in mid-2020 reported that dentists in Europe (OR 1.45, 95% CI 1.02–1.84) and Asia (OR 2.68, 95% CI 1.45 - 3.22) considered it “likely” or “very likely” to acquire COVID-19 at work [30] Similarly, a Mexican survey of 996 dentists found that 73% fully agreed that attending patients posed a risk for SARS-CoV-2, with variations influenced by age and geographic region [31].

Moreover, systematic reviews confirm that dental personnel are at increased risk compared to administrative staff. Pre-vaccination meta-analysis estimated 12.7% prevalence of SARS-CoV-2 among dentists and hygienists, significantly higher than the 5.2% observed in assistants [32]. Such data underscore why a majority of respondents in our study believe the risk lies between 51–95%.

This contrast between high perceived risk and low measured transmission highlights important psychological and professional dynamics. Risk perception among dental professionals is understandably influenced by close patient contact, aerosol-generating procedures, and invasive oral work. Heightened awareness can be protective, often leading to better adherence to infection control measures - but it can also introduce stress and anxiety.

However, despite increased awareness and improvements in infection control practices, occupational risks in dentistry remain - particularly in the form of sharps-related injuries. Needlestick injuries continue to be prevalent, especially among less experienced dentists and dental students. Numerous international studies have demonstrated that students and early-career dentists are especially vulnerable to percutaneous injuries, underscoring the need for targeted educational programs and close supervision during clinical training [33,34].

Our findings revealed that dentists aged 30 years or younger have a significantly diminished likelihood of experiencing such injuries compared to those aged 50 and older (OR=0.136, 95% CI: 0.033-0.568, p=0.006). Additionally, dental personnel working in state clinics appear to face a higher risk of injury than those employed in private or alternative healthcare settings. This may be associated with heavier patient loads, limited resources, and suboptimal working conditions in the public healthcare sector.

In Kazakhstan, public health systems - particularly in the area of infection prevention - require further development. While sanitary and hygiene protocols do exist in hospitals and dental clinics, they are often insufficient to prevent the transmission of serious infections such as hepatitis B, C, D, and HIV. The risk of occupational exposure to these diseases remains a significant concern, especially in dental practice where contact with blood and bodily fluids is routine.

Although COVID-19 brought global attention to the importance of strict infection control, there is growing concern that, as the immediate threat of the pandemic fades from public consciousness, complacency has begun to re-emerge. Some healthcare workers may now underestimate the importance of sustained protective measures, such as proper use of personal protective equipment (PPE), hand hygiene, and environmental disinfection. This regression poses a serious risk - not only for future outbreaks of COVID-19 variants, but also for the ongoing transmission of other infectious diseases in dental environments.

This study is part of a broader doctoral research project aimed at evaluating occupational exposure and infection risks among dental professionals. Based on our findings, we plan to submit specific recommendations to the Ministry of Health of the Republic of Kazakhstan, with a focus on strengthening infection prevention protocols, especially against hepatitis viruses (B, C, D) and HIV. Special attention will be directed toward improving training for dental professionals, enhancing biosecurity standards in public clinics, and reinforcing long-term adherence to protective practices initiated during the COVID-19 pandemic.

Our study has some limitations. The primary limitation of the study is the cross-sectional design which does not allow for assessment of temporal associations. For example, issues with reverse causality may exist such that opinions have been

influenced by the trauma. Second, given that exposure to trauma is based on self-reported data, it is likely that not all injuries were reported in the survey. Our study therefore likely underestimated the true risk of transmission to infection. However, this is one of the studies in Kazakhstan dedicated to the assessment of the knowledge, attitudes, and practices related to transmission infection among medical workers in dental clinic.

Conclusion.

Dental professionals in East Kazakhstan face a significant risk of occupational exposure to infectious diseases such as hepatitis B, C, D, HIV, and COVID-19. Our study identified several key risk factors for skin injuries, including older age, longer work experience, and employment in public (state) dental clinics. These findings suggest that more experienced personnel and those working in state clinics may be at greater risk due to cumulative exposure or insufficient workplace safety standards.

While infection control awareness has improved, particularly following the COVID-19 pandemic, challenges persist - such as inconsistent use of personal protective equipment (PPE), underreporting of injuries, and inadequate infection prevention infrastructure.

We recommend strengthening occupational safety training, enforcing mandatory injury reporting, and maintaining strict infection control protocols. These evidence-based recommendations will be submitted to the Ministry of Health of the Republic of Kazakhstan to improve infection prevention in dental settings.

Conflicts of interest.

The authors declare that there were no conflicts of interest in the study.

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რეზიუმე

ფონური ინფორმაცია: ჯანდაცვასთან დაკავშირებული ინფექციები (HCRI) კვლავ წარმოადგენს გლობალურ პრობლემას, განსაკუთრებით სტომატოლოგიაში, სადაც ნერწყვთან, სისხლთან და აეროზოლებთან კონტაქტი ზრდის ჯვარედინი ინფექციის რისკს. COVID-19-ის პანდემიამ ხაზი გაუსვა სტომატოლოგიური პერსონალის მოწყვლადობას ჰაერწვეთოვანი გზით გადამდები პათოგენების მიმართ და გამოიწვია მკაცრი პროტოკოლების დანერგვა, როგორიცაა გაძლიერებული ინდივიდუალური დაცვის საშუალებები (PPE) და ვენტილაცია. თუმცა, პრობლემად რჩება ბიოუსაფრთხოების შესახებ არასაკმარისი ცოდნა და არათანამიმდევრული პრევენციული პრაქტიკა.

კვლევის მიზანი: ამ კვლევის მიზანი იყო ინფექციური დაავადებების, მათ შორის COVID-19-ის გადაცემის რისკ-ფაქტორების შეფასება აღმოსავლეთ ყაზახეთში სტომატოლოგიური მომსახურებისას სამედიცინო პერსონალს შორის. მასალები და მეთოდები: შესწავლილ იქნა შემდეგი ცვლადები: სოციალურ-დემოგრაფიული მახასიათებლები; სამუშაოზე ტრავმის მიზეზი, დრო, გარემოებები და სახეობა; პროფესიული ტრავმის აღრიცხვის დოკუმენტაცია; ინფექციების გადაცემის პრევენციისა და კონტროლის შესახებ ცოდნა და დამოკიდებულება სამუშაოს შესრულებისას. ხარისხობრივი მონაცემებისთვის გამოყენებული იქნა პირსონის χ^2-ტესტი. ჩატარდა ბივარიანტული ანალიზი კანის დაზიანებასა და დამოუკიდებელ ცვლადებს შორის კავშირის დასადგენად. შედეგები: უმეტესწილად წარმოდგენილი იყო 41–50 წლის ასაკობრივი ჯგუფი (37,9%). საშუალო სამუშაო გამოცდილება იყო 6–10 წელი (29,6%). პროფესიული მოვალეობის შესრულებისას კანის დაზიანება აღენიშნებოდა მონაწილე მამაკაცთა 82,9%-ს და ქალთა 89,0%-ს. ყველაზე ხშირი დაზიანება იყო პაციენტის სისხლის მოხვედრა კანზე (38,2%) და ბასრი საგნით კანის გახვრეტა (31,5%). ყველაზე ხშირი შემთხვევები პრაქტიკაში დაკავშირებული იყო ბარიერების (დაცვის საშუალებების) არ გამოყენებასთან — მამაკაცთა 48,7% და ქალთა 33,1%. დასკვნები: აღმოსავლეთ ყაზახეთში სტომატოლოგიურ საქმიანობაში პრევენციული ღონისძიებების გაუმჯობესებაა საჭირო. პრაქტიკაში ყველაზე ხშირი ინციდენტები ბარიერების არ გამოყენებას უკავშირდება.

საკვანძო სიტყვები: სტომატოლოგია, ინფექცია, შიდსი, ჰეპატიტი, COVID-19, ყაზახეთი.

Аннотация

Введение: Инфекции, связанные с оказанием медицинской помощи, остаются серьёзной глобальной проблемой, особенно в стоматологии, где контакт со слюной, кровью увеличивает риск перекрёстного заражения. Пандемия COVID-19 показала уязвимость стоматологов к воздушно-капельным инфекциям, что привело к ужесточению протоколов, включая усиленное использование средств индивидуальной защиты (СИЗ) и улучшение вентиляции. Тем не менее, остаются сложности, связанные с недостаточными знаниями в области биобезопасности и несогласованностью профилактических мер.

Цель исследования: Оценка факторов риска передачи инфекционных заболеваний, включая COVID-19, среди медицинского персонала при оказании стоматологической помощи в Восточном Казахстане. **Материалы и методы:** Были изучены следующие переменные: социально-демографические характеристики; причина, время, обстоятельства и характер травмы на рабочем месте; наличие документации для регистрации профессиональных травм; знания и отношение к мерам профилактики и контроля передачи инфекций при выполнении профессиональных обязанностей. Для анализа качественных данных

использовался критерий χ^2 Пирсона. Также был проведён бивариативный анализ для выявления связи между травмированием кожи при выполнении профессиональных обязанностей и независимыми переменными.

Результаты: Основную возрастную группу составляли лица в возрасте 41–50 лет (37,9%). Средний стаж работы - от 6 до 10 лет (29,6%). Большинство участников имели повреждения кожи при выполнении профессиональных обязанностей: 82,9% мужчин и 89,0% женщин. Наиболее распространённый характер травм - попадание крови пациента на кожу (38,2%) и проколы кожи острыми инструментами (31,5%). Наиболее частыми причинами инцидентов стала неиспользование защитных барьеров: у 48,7% мужчин и 33,1% женщин.

Заключение: Профилактические меры в стоматологической практике в исследуемом регионе требуют улучшения. Наиболее частые инциденты происходили из-за неиспользования защитных барьерных средств.

Ключевые слова: Стоматология, инфекция, ВИЧ, гепатит, COVID-19, Казахстан**.**