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ABSTRACT

of the dissertation for the degree
of Doctor of Philosophy

THE SIGNIFICANCE OF MICROBIOLOGICAL CRITERIA AND EVIDENCE IN FORENSIC MEDICINE

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GENERAL CHARACTERISTICS

Relevance of the topic. Knowledge of the interactions between humans and both endogenous and exogenous flora provides a basis for addressing a number of traditional and emerging forensic challenges and contributes to the development of forensic medical examination as a field of forensic microbiological examination[1].

The study of the microbiota in forensic medicine is an important and promising area of research[2].

Many situations are well known in forensic medical practice in which several examinations are conducted in the same case, including repeat, additional, panel, comprehensive, and situational examinations. In conducting such examinations, experts are presented with new questions that arise during the investigation, while they are also asked to confirm conclusions that were previously formulated. In such cases, an extremely negative phenomenon has begun to emerge in practice: in "new" forensic medical examinations conducted by other experts using the same initial data, different, often contradictory and mutually exclusive conclusions are obtained[3].

The personality of a person who has committed a crime has been a central subject of study in many fields of science that intersect with criminology. The personality of a drug-dependent individual represents a specific type characterized by socio-moral degradation associated with the specific effects of drug addiction. The personality of individuals in this category differs from that of law-abiding citizens, as well as from that of other offenders.

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1. Лаврукова, О.С. Использование микробиологических данных для целей судебно-медицинской экспертизы / О.С. Лаврукова, Н.А. Сидорова // – Москва: Судебно-медицинская экспертиза, – 2024. 67 (5), – с. 55 61.

2. Фоминых, Т.А. Основные методы исследования в современной судебной медицине / Т.А. Фоминых, Б.Л. Куцевол, А.Г. Саенко [и др.] // Крымский журнал экспериментальной и клинической медицины, – Симферополь: – 2021. №4, – р.106-117.

3. Ангархаев, А.В. Судебно медицинская экспертиза // – Саратов: Теория и практика современной науки, – 2015. №6 (6), – с. 46-48.

This leads to the conclusion that there is a need to distinguish one type of offender from other types[4].

The human microbiome is the collection of microorganisms inhabiting various ecosystems of the human body, including the gut, skin, respiratory tract, and oral cavity. In recent decades, microbiome research has attracted the attention of scientists worldwide, as microbiota have been found to play a key role in maintaining human health and in the pathogenesis of various diseases. The composition of the microbiome is unique to each individual and depends on numerous factors, including genetics, diet, lifestyle, and the environment[5].

From a modern perspective, the human microbiota should be regarded as a complex community of microorganisms comprising numerous microbial populations that occupy the diverse ecological niches of the skin and mucous membranes. The study of the human microbiota is currently being extensively pursued as an emerging field of biomedical science[6].

Let us consider several new key concepts used to characterize the normal human microbiota (normoflora): microbiota is the community of microorganisms living in symbiosis with a macroorganism; microbiome is the collective genetic material of microorganisms within a specific internal ecosystem or ecological niche; holobiont ("superorganism") refers to a unit of natural selection comprising the host organism and its microbiota[7].

4. Токолова, А.Ю. Особенности личности преступника-наркомана /А.Ю. Токолова, О.А. Наумочкина // – Курск: Уголовное право в эволюционирующем обществе: проблемы и перспективы, – 2021, – с. 425-428.

5. Hou, K. Microbiota in health and diseases / K. Hou, Z.X. Wu, X.Y. Chen [et al.] // Signal Transduction and Targeted Therapy, – 2022. 7, – p. 135.

6. Абдугаффаров, С.О. Роль микрофлоры в жизнедеятельности человека / С.О. Абдугаффаров, С.С. Рахимжонов, А.Е. Бобокулов [и др.] // Медицина. Социология. Философия. Прикладные исследования, – Москва: – 2020. №4. – с. 54-57.

7. Харитонова, Л.А. Микробиота человека: достижения науки и медицинская практика / Л.А. Харитонова, К.И. Григорьев, С.Н. Борзакова [и др.] // Медицинская сестра, – Москва: – 2018. № 4, – с. 40-46.

Normoflora (normal microbiota) is a specific qualitative and quantitative balance of different microbial populations inhabiting the gastrointestinal tract and other organs and tissues of the mucous membranes. It maintains the biochemical, metabolic, and immunological balance of the macroorganism and is essential for maintaining its normal physiological state[8].

The study of the microbiome is considered an important area of research in forensic science. It is also well established that forensic investigations extensively address crimes committed by individuals with substance-use disorders, including drug-dependent individuals and those with alcohol dependence. In recent years, the number of crimes committed under the influence of narcotic substances has been increasing[9]. Studies conducted by WHO have provided data on the increase in crime associated with alcoholism[10].

Analysis of the criminological profile of an offender is of considerable importance for studying the mechanisms of criminal behavior, as well as for developing measures to prevent this type of crime[11].

Alcohol intoxication has also been regarded as socially acceptable throughout the world and across millennia and has been incorporated into many social and cultural activities[12].

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8. Астафьева, Н.Г. Роль микробиома дыхательных путей в респираторном здоровье / Н.Г. Астафьева, Д.Ю. Кобзев, И.В. Гамова [и др.] // Лечащий врач, – Москва: – 2019. № 4, – с. 1-6.

9. Миннебаев, Р.Х. Наркотизация как фактор преступности // – Москва: Вестник Нижегородской академии МВД России, – 2014, – №4 (28), – с. 145-150.

10. Бахтеев, С.С. Проблемы алкоголизма и преступности // – Челябинск: Правопорядок: история. теория. Практика, – 2014. №1 (2). – с.101-103.

11. Алонцева, Д.В. Особенности личности субъектов преступлений в сфере незаконного оборота наркотических и психотропных веществ / Д.В. Алонцева, О.А. Лаврищева // – Москва: Журнал Юридических Исследований, – 2022. Том 7. – № 3

12. Measham, F. “Binge” drinking. British alcohol policy and the new culture of intoxication / F. Measham, K. Brain // Crime, Media, Culture, – 2005. 1, – p. 262-283.

The legal status and widespread acceptance of alcohol use often result in the harms it causes to health and society being overlooked or underestimated[13].

Using data collected through the Alcohol Toolkit Survey in England, 20% of respondents reported that they had harmed others while under the influence of alcohol, while 5% reported causing aggressive harm, including physical threats and physical pain. The study included 63,725 young people aged 18–24 years. It is believed that alcohol can induce psychological changes that contribute to involvement in criminal behavior. These changes include affective states such as emotional lability, as well as cognitive changes affecting risk perception and working memory[14].

The behavioral pattern of avoiding criminal activity changes among individuals who consume large amounts of alcohol. Being around such people means entering the realm of risk[15].

At the end of the 20th and beginning of the 21st centuries, the spread of drug addiction became one of the main social problems worldwide. In this regard, the organization of measures to combat and prevent drug addiction is of particular importance, taking into account the social, hygienic, and socioeconomic characteristics of different regions, including Azerbaijan. Over the past several years, a substantial body of information devoted to narcological research has been published in the scientific literature. These studies are driven not only by scientific interest but also by the widespread prevalence of drug addiction worldwide and its serious medical, social, and economic consequences.

13. Moss, H.B. The impact of alcohol on society: A brief overview // Soc. Work Public Health, – 2013. 28, – p. 175-177.

14. Evans, I. The Influence of Alcohol Consumption on Fighting. Shoplifting and Vandalism in Young Adults / I. Evans, J. Heron, J. Murray [et al.] // International Journal of Environmental Research and Public Health, – 2021. 18(7), – p. 3509.

15. Hammerton, G. Effects of Excessive Alcohol Use on Antisocial Behavior Across Adolescence and Early Adulthood / G.Hammerton, L. Mahedy, J. Murray [et al.] // Journal of the American Academy of Child & Adolescent Psychiatry, – 2017. 56(10), – p. 857-865.

An analysis of the scientific literature indicates that research addressing the epidemiological aspects of drug dependence, analyzing the factors contributing to the spread of this serious social phenomenon, and examining the economic damage caused by drug addiction to society still remains insufficient. Thus, given the high prevalence of drug-dependent individuals and those with alcohol dependence in forensic practice, as well as the potential use of microbiological criteria as highly reliable evidence in forensic medical examinations, the present study aims to comparatively analyze and substantiate the relevant microbiome parameters of drug-dependent individuals and those with alcohol dependence as an important and timely scientific issue.

Object of the research: A total of 122 individuals were included in the study. They were divided into three groups: Group I (healthy individuals) - 31 individuals; Group II (drug-dependent individuals) - 48 individuals; and Group III (individuals with alcohol dependence) - 43 individuals.

Purpose of the research. To investigate the prospects for using the results of human microbiome analysis for personal identification, crime detection, and criminal investigation, and to provide a scientific basis for their use as evidence in forensic medicine and criminology.

Tasks of the research:

1. To study the clinical and social characteristics of the drug-dependent individuals and individuals with alcohol dependence included in the study;
2. To conduct a comparative analysis of the results of microbiological examination of blood samples in different groups of individuals (drug-dependent individuals, individuals with alcohol dependence, and healthy individuals);
3. Comparative analysis of the results of microbiological examination of the oral mucosa and saliva in the study participants (drug-dependent individuals, alcohol-dependent individuals, and healthy individuals);
4. To conduct a comparative analysis of the results of microbiological examination of nasopharyngeal specimens in examined

individuals (drug-dependent individuals, individuals with alcohol dependence, and healthy individuals);

5. To conduct a comparative analysis of the results of microbiological examination of the skin in different groups of individuals (drug-dependent individuals, individuals with alcohol dependence, and healthy individuals);

6. To study the problems and prospects of forensic identification based on the human microbiome and to substantiate the significance of microbiological examinations for forensic medicine.

Research methods:

1. Anamnestic
2. Clinical
3. Microbiological
4. Mathematical and statistical

Scientific novelty of the research:

1. The feasibility of using material evidence of microbial origin in forensic medical examinations has been scientifically substantiated.

2. The relevance of examining the results of microbiological analysis of different anatomical sites in drug-dependent individuals, individuals with alcohol dependence, and healthy individuals for forensic medicine has been investigated.

3. A unified system has been developed based on the results of examining the quantitative and qualitative composition of the microbiota of the oral cavity, nasopharynx, and skin in different groups of individuals (drug-dependent individuals, individuals with alcohol dependence, and healthy individuals).

Practical significance of the research:

1. Drug-dependent individuals were found to have a more severe clinical and social status than individuals with alcohol dependence, a less favorable prognosis in terms of life expectancy, as well as distinct microbiological aspects of their health status. In drug-dependent individuals and individuals with alcohol dependence, the presence and distribution of potentially pathogenic fungal genera, including C. krusei, Penicillium, Mucor, Rhizopus, Absidia, and P. notatum, on the skin were determined and compared with those in healthy individuals.

2. The presence of potentially pathogenic microorganisms, including Staphylococcus aureus, Staphylococcus epidermidis, and Klebsiella pneumoniae, was detected in the blood of individuals with drug dependence and alcohol dependence, in contrast to healthy individuals. These microorganisms were found at a higher frequency among drug-dependent individuals and the practical significance of these findings was investigated.

3. It has been proposed that the results of microbiological examinations be used in forensic medicine as reliable evidence and criteria for investigation.

4. It has been proposed that microbiological examinations be used as an important method for identifying infectious processes, poisoning, and crime-related facts, as well as for diagnosing diseases that may be associated with violent death or bodily injury.

Main Provisions Submitted for Defense:

1.The human microbiome comprises billions of microorganisms, including bacteria, viruses, fungi, and archaea, that inhabit the skin, oral cavity, respiratory tract, and other organs. Harmful habits, particularly drug addiction and alcohol dependence, have a profound impact on the human microbiome.

2. The microbiota of the skin and nasopharyngeal mucosa in drug-dependent individuals and individuals with alcohol dependence differs from that of healthy individuals in terms of species composition.

3. The integration and application of findings from the study of the human body's various microbiome environments into forensic science pave the way for future prospects.

4. Drug-dependent individuals and alcohol-dependent individuals are exposed to more hazardous microorganisms, with the prevalence of hazardous microorganisms being higher among drug addicts.

5. In contrast to healthy individuals, the detection of microorganisms such as S. pyogenes and S. capitis in nasopharyngeal specimens from drug-dependent individuals and individuals with alcohol dependence indicates their exposure to serious infections.

Application of the research results. The practical recommendations proposed in the research have been implemented in the practical activities of the Surakhani District Branch, Khazar District Branch, Nasimi District Branch, and Sabunchu District Branch of the "Forensic Medical Examination and Pathological Anatomy Association."

Approbation. The results of the research were presented and discussed at the following scientific conferences:

9th International Conference on Medical Health Sciences, Conference Proceedings Book, Dubai, UAE, June 10, 2025;

Natural Sciences and Medicine: Theory and Practice, LXXXIII International Scientific and Practical Conference, Novosibirsk, June 2025;

The results of the research were presented and discussed at the interdepartmental meeting of Azerbaijan Medical University on April 30, 2025 (Protocol No. 09), and at the Scientific Seminar of the FD 2.28 Dissertation Council of Azerbaijan Medical University on June 10, 2026 (Protocol No. 01).

Publications. Based on the results of the research, 15 scientific works have been published, including 8 articles and 7 abstracts.

Volume and Structure of the Dissertation. The dissertation was written in Azerbaijani on A4 paper using 14-point Times New Roman font and 1.5 line spacing. It comprises the following sections: table of contents (3,626 characters), introduction (11,025 characters), literature review (59,564 characters), Chapter II, covering the materials and methods of the study (26,524 characters), Chapter III, presenting the results of the author's own research (21,860 characters), Chapter IV, providing the rationale for the selection of the examination method and discussion of the results obtained (59,544 characters), conclusion (35,242 characters), findings (4,946 characters), and practical recommendations (661 characters). The dissertation consists of 165 pages, with a total volume of 223,083 characters. It is illustrated with 18 graphs, 29 tables, and 2 figures. The reference list comprises 192 sources, including 16 works by Azerbaijani authors, 51 by Russian authors, and 125 by foreign authors.

MATERIALS AND METHODS

A total of 122 individuals were included in the study. The study participants were divided into the following groups:

Group I comprised 31 practically healthy individuals who did not use narcotic substances, did not have alcohol dependence, and had never been exposed to these harmful habits (41.9% were female and 58.1% were male). The mean age was 42.3 ± 2.33 years.

Group II comprised 43 individuals (100% male) who had used various narcotic substances, including opioids, cocaine, amphetamine-type substances, and hallucinogens, for more than 5 years and were registered as drug-dependent individuals. The mean age was 31.4 ± 1.1 years.

Group III comprised 48 individuals with varying degrees of alcohol intoxication (1–5‰ and ≥5‰). Of these, 32.6% were female and 67.4% were male. The mean age was 44.1 ± 1.33 years.

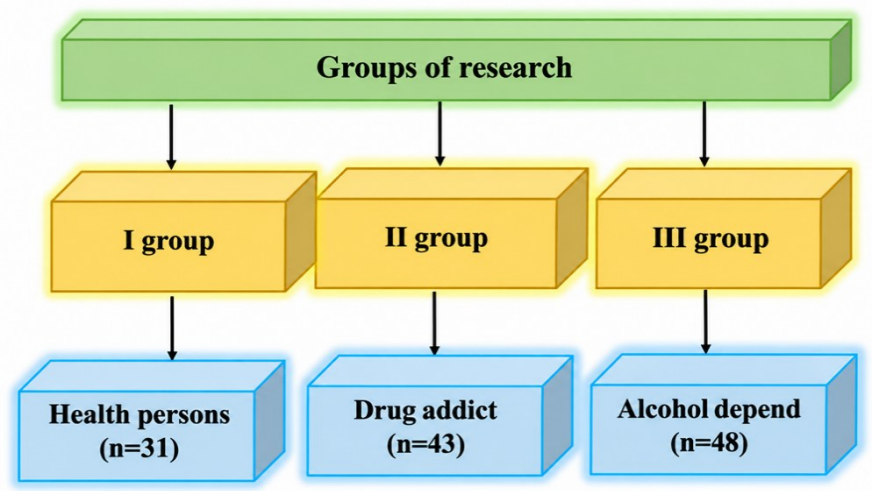


Figure 1. Study design

All participants signed an informed consent form indicating their agreement to participate in the study.

Inclusion criteria:

-Age between 18 and 60 years;

-A diagnosis of "Drug dependence" or "Alcohol dependence syndrome" according to the ICD-10 criteria.

Exclusion criteria:

- Individuals under 18 years of age;
- Individuals with severe comorbid psychiatric disorders;
- Individuals with severe somatic diseases;
- Individuals who declined to participate in the study;
- Individuals with HIV infection.

In Group I, 41.9%, in Group II, 60.4%, and in Group III, 48.8% of the participants were rural residents. In Group I, 61.3%, in Group II, 58.3%, and in Group III, 32.6% were engaged in various forms of employment.

In Group I, 58.1%, in Group II, 35.4%, and in Group III, 25.6% of the participants were married. Divorce was recorded in 32.3% of participants in Group I, 56.3% in Group II, and 41.9% in Group III.

Anamnestic data, family history, lifestyle, and various sociodemographic characteristics of the participants with harmful habits included in the study (drug users and individuals with alcohol dependence) were recorded on specially designed data collection forms.

Body mass index (BMI) was determined for all participants.

The microbiological examinations conducted as part of the study were performed at the Sunlab Laboratory. Microscopic, bacteriological, and mycological examinations of clinical specimens were carried out using generally accepted methods.

Statistical analysis of the obtained results was performed using the Statistica 7.0 software package. Quantitative variables were presented as the mean (M), standard error (m), minimum (min), and maximum (max) values. The statistical significance of differences between groups was assessed using the non-parametric Mann–Whitney U test, while Pearson's χ^2 test was used to compare frequencies. Correlation analysis was used to investigate associations between variables. A p-value of <0.05 was considered statistically significant.

RESEARCH RESULTS

Addiction to substances such as drugs and alcohol has similar pathophysiological mechanisms, while also demonstrating significant differences manifested in the clinical condition of patients. Both types of dependence can lead to serious physical, psychological, and social consequences. However, their manifestations and effects on human health may vary considerably depending on the type of substance, duration of use, dose, and individual characteristics of the organism.

During the course of the study, the duration of drug use was determined in Group III, i.e., the group comprising drug-dependent individuals who were included in the study.

During the study, the duration of drug use was determined among the participants in the group comprising drug-dependent individuals. The duration of drug use was approximately divided into three categories: up to 5 years, 6–10 years, and 10–15 years. It was analyzed separately among employed and unemployed drug-dependent individuals within these categories. Of the 43 drug-dependent individuals included in the study, 13 (30.2%) were employed, while the remaining 27 (62.7%) were unemployed. Among the employed participants, 6 (14.0%) had used drugs for up to 5 years, 2 (4.7%) for 6-10 years, and 5 (11.6%) for 10-15 years. Among the unemployed participants, 1 (2.3%) had used drugs for up to 5 years, 12 (27.9%) for 6-10 years, and 14 (32.6%) for 10-15 years.

Among the drug-dependent individuals included in the study, the most frequently observed clinical sign was hand tremor, which was detected in 26 (60.5%) participants. Fatigue was the least frequently recorded clinical sign, occurring in 17 (39.5%) participants. However, insomnia was observed in 25 (58.1%) participants, while elevated blood pressure was detected in 23 (53.5%) participants.

Memory impairment and attention deficits were identified in 23 (53.5%) of the participants included in the study.

Mild, moderate, and severe alcohol dependence were identified in 29.2%, 43.8%, and 27.1% of participants, respectively.

Thus, all psychological and emotional disorders were more prevalent among drug-dependent individuals than among those with

alcohol dependence. Among drug-dependent individuals, behavioral disorders were 26.2% more common, speech difficulties were 11.8% more common, and anxiety and agitation were 4.5% more common.

Among drug-dependent individuals, neurological and psychiatric disorders were found to predominate among various somatic pathologies. These conditions were manifested in 34.9% of participants as stroke, behavioral disorders, and intellectual impairment. Respiratory disorders, including severe allergic rhinitis, bronchial asthma, and pneumonia, were identified in 18.6% of participants. Gastrointestinal diseases were detected in 20.9%, endocrine disorders in 11.6%, hemolytic conditions in 9.3%, cardiovascular diseases in 4.7%, and oncological diseases in 2.3% of participants.

The structure and quantitative composition of comorbidities among the alcohol-dependent individuals included in the study were determined. Cardiovascular diseases were the most frequently recorded comorbidities, accounting for 33.3% of cases. Gastrointestinal diseases accounted for 27.1%, endocrine and neuropsychiatric disorders for 16.7%, and oncological and hematological diseases for 6.3%.

A comparative analysis of the characteristics of the skin microbiome and the structure of mycological infections among drug-dependent individuals and those with alcohol dependence in the study groups was conducted. Biological specimens obtained by skin scraping from all participants were examined for fungi belonging to the genera Candida, Zygomycota, Aspergillus, and Mucoromycota.

Among fungi of the genus Candida, *C. albicans* was identified in 51.2% of participants, *C. tropicalis* in 44.2%, and *C. krusei* in 41.9%. Thus, *C. albicans* was the predominant species among Candida isolates.

Among the representatives of the genus Aspergillus, *Aspergillus niger* was detected in 44.2%, *A. flavus* in 39.5%, and *A. fumigatus* in 34.9% of participants. The highest frequency in this group was recorded for A. niger. Representatives of the genus Penicillium were also characterized by relatively high frequencies: *P. notatum* was identified in 41.9% and *P. glaucum* in 44.2% of participants. Among the zygomycetes, Mucormycosis was detected in 39.5%, Rhizopus in 37.2%, and Absidia in 34.9%.

Thus, among the skin samples obtained from the drug-dependent individuals included in the study (n=43), Cryptococcus was detected at the highest frequency, accounting for 74.4%.

The quantitative composition of the skin microbiome was determined in the alcohol-dependent individuals included in the study. When fungal contamination of the skin was assessed among the alcohol-dependent individuals, P. notatum and Rhizopus were not detected. Cryptococcus, which was frequently detected among drug-dependent individuals (74.4%), was recorded in 37.5% of the alcohol-dependent individuals. C. albicans and C. tropicalis were more frequently detected among the alcohol-dependent individuals, accounting for 45.8% and 47.9%, respectively. Absidia, a fungal genus also detected among the drug-dependent individuals and considered potentially hazardous, was identified in 12.5% of the alcohol-dependent individuals.

A comparative analysis of the skin microbiome structure was performed across the study groups. According to the presented data, statistically significant differences in the prevalence of certain fungal species were observed between the groups (Table 1).

Table 1

Comparative quantitative indicators of the skin microbiome structure across the study groups

Indicators	Group I	Group II	Group III
C.albicans	-	46	-
C.tropicalis	13	48	44
C.krusei	-	21	42
A.flavus	26	29	40
A.fumygatus	42	15	35
Aspergillus niger	23	27	44
P.notatum	-	-	42
P.glaucum	42	19	44
Mucormycosis	-	21	40
Rhizopus	-	-	37
Absidia	-	13	35

C. albicans was detected in 46 cases in the healthy individuals' group. It was not detected in the groups of alcohol-dependent or drug-dependent individuals. No statistically significant difference was found between healthy and alcohol-dependent individuals ($p=0.9533$), between alcohol-dependent and drug-dependent individuals ($p=0.6103$, $\chi^2=0.26$), or between healthy and drug-dependent individuals ($p=0.6115$, $\chi^2=0.26$).

C. tropicalis was detected in 13 cases in the healthy individuals' group, 48 cases among alcohol-dependent and 44 cases among drug-dependent individuals. A statistically significant difference was found between healthy and alcohol-dependent individuals ($p=0.014$, $\chi^2=10.26$), while no statistically significant difference was observed between healthy and drug-dependent individuals ($p=0.7215$, $\chi^2=0.13$). A statistically significant difference was also recorded between alcohol-dependent and drug-dependent individuals ($p=0.041$, $\chi^2=8.23$). These findings indicate that *C. tropicalis* was particularly prevalent in the group of alcohol-dependent individuals.

C. krusei was not detected among healthy individuals, whereas it was identified in 21 cases among alcohol-dependent individuals and in 42 cases among drug-dependent individuals. No statistically significant difference was found between healthy and alcohol-dependent individuals ($p=0.065$, $\chi^2=7.39$), or between healthy and drug-dependent individuals ($p=0.300$, $\chi^2=4.71$). However, a highly statistically significant difference was observed between alcohol-dependent and drug-dependent individuals ($p<0.001$, $\chi^2=17.15$).

A. flavus was detected in 26 cases among healthy individuals, 29 cases among alcohol-dependent individuals, and 40 cases among drug-dependent individuals. No statistically significant differences were observed between healthy and alcohol-dependent individuals ($p=0.7449$, $\chi^2=0.11$), between alcohol-dependent and drug-dependent individuals ($p=0.2180$, $\chi^2=1.20$), or between healthy and drug-dependent individuals ($p=0.2975$, $\chi^2=1.90$) ($p>0.05$).

A. fumigatus was detected in 42 cases among healthy individuals, 15 cases among alcohol-dependent individuals, and 35 cases among drug-dependent individuals. No statistically significant differences

were found between healthy and alcohol-dependent individuals ($p=0.063$; $\chi^2=7.45$), between alcohol-dependent and drug-dependent individuals ($p=0.5372$; $\chi^2=0.38$), or between healthy and drug-dependent individuals ($p=0.239$; $\chi^2=5.10$) ($p>0.05$).

Aspergillus niger was detected in 23 cases among healthy individuals, 27 cases among alcohol-dependent participants, and 44 cases among drug-dependent individuals. The differences were not statistically significant between healthy and alcohol-dependent individuals ($p=0.6531$, $\chi^2=0.20$), between alcohol-dependent and drug-dependent individuals ($p=0.548$, $\chi^2=3.69$), or between healthy and drug-dependent individuals ($p=0.880$, $\chi^2=2.91$).

P. notatum was not detected in the healthy or alcohol-dependent groups but was identified in 42 cases in the drug-dependent group. This represents one of the most notable differences presented in the table. A highly statistically significant difference was observed between the healthy and drug-dependent groups ($p<0.001$, $\chi^2=25.50$), as well as between the alcohol-dependent and drug-dependent groups ($p<0.001$, $\chi^2=17.15$). Thus, *P. notatum* was detected at a high frequency among drug-dependent participants.

Overall, the comparison of fungal pathogens across the three groups shows that no statistically significant differences were observed for most indicators between the healthy and alcohol-dependent groups. The main changes were identified in the drug-dependent group.

Absidia was not detected in healthy individuals, whereas it was identified in 13 cases among alcohol-dependent individuals and in 35 cases among drug-dependent individuals. No statistically significant difference was found between healthy and alcohol-dependent individuals ($p=0.406$, $\chi^2=4.19$) or between healthy and drug-dependent individuals ($p=0.114$, $\chi^2=6.40$). Compared with alcohol-dependent individuals, Absidia was statistically significantly more frequent among drug-dependent individuals ($p=0.002$, $\chi^2=13.56$, $p>0.05$).

Overall, these findings indicate that changes in the fungal spectrum, particularly in the drug-dependent group, and the higher frequency of detection of certain opportunistic fungi in this group are

noteworthy. However, these findings do not, by themselves, establish a cause-and-effect relationship; they only indicate the presence of a statistical association between the groups.

A comparative analysis of the quantitative composition of microorganisms in the nasopharyngeal tract was performed across the study groups. The quantitative levels of various microorganisms were comparatively analyzed in the groups of healthy individuals, drug-dependent individuals, and alcohol-dependent individuals. It was found that the mean quantity of Staphylococcus spp. in healthy individuals was 5,002 ± 69 CFU/mL (4,000–5,600), whereas this value was 884,475 ± 13,834 CFU/mL (565,400–985,200) in drug-dependent and 8,090,328 ± 173,543 CFU/mL (5,784,500–9,980,000) in alcohol-dependent individuals. The quantity of Staphylococcus spp. was statistically significantly higher in drug-dependent than in healthy individuals ($p<0.001$, $t=32.26$). The increase was even more pronounced in alcohol-dependent individuals, and the difference compared with healthy individuals was also statistically significant ($p<0.001$, $t=23.81$). The level of Staphylococcus spp. was also statistically significantly higher in alcohol-dependent than in drug-dependent individuals ($p<0.001$, $t=23.93$). These findings indicate that the highest level of Staphylococcus spp. was observed in alcohol-dependent individuals.

A similar trend was observed for Streptococcus spp. The mean value was 861 ± 30 CFU/mL (100–1,000) in healthy, 771,613 ± 16,470 CFU/mL (500,000–980,800) in drug-dependent, and 6,377,805 ± 188,014 CFU/mL (4,580,000–8,750,800) in alcohol-dependent individuals. Compared with healthy individuals, statistically significant differences were found in drug-dependent ($p<0.001$, $t=26.52$) and alcohol-dependent individuals ($p<0.001$, $t=19.65$). The difference between alcohol-dependent and drug-dependent individuals was also highly statistically significant ($p<0.001$, $t=19.26$). Thus, the quantity of Streptococcus spp. was significantly higher in both dependence groups than in healthy individuals, with the highest value recorded among alcohol-dependent individuals.

For Enterobacteriaceae spp., the mean value in healthy individuals was 4,808 ± 88 CFU/mL (4,000–5,600). In drug-dependent individuals, this value was 71,301 ± 3,449 CFU/mL (14,000–95,600), whereas in alcohol-dependent individuals it was 82,534 ± 2,539 CFU/mL (14,000–95,600). A statistically significant increase was observed in both dependence groups compared with healthy individuals, with significantly higher values in drug-dependent ($p<0.001$, $t=14.50$) and alcohol-dependent individuals ($p<0.001$, $t=18.46$). However, the difference between drug-dependent and alcohol-dependent individuals was not statistically significant ($p=0.104$, $t=2.63$).

For Micrococcus spp., the mean value was 881 ± 12 CFU/mL (800–1,000) in healthy, 63,650 ± 5,465 CFU/mL (11,000–234,900) in drug-dependent, and 1,030,716 ± 185,853 CFU/mL (110,000–8,778,900) in alcohol-dependent individuals. The values were statistically significantly higher in drug-dependent ($p<0.001$, $t=9.77$) and alcohol-dependent individuals ($p<0.001$, $t=5.16$) compared with healthy individuals. It was also statistically significantly higher in alcohol-dependent individuals than in drug-dependent individuals ($p<0.001$, $t=4.91$).

For Neisseria spp., the mean value was 861 ± 29 CFU/mL (100–1,000) in healthy individuals, 4,775 ± 145 CFU/mL (1,000–5,900) in drug-dependent individuals, and 6,714 ± 233 CFU/mL (4,000–9,900) in alcohol-dependent individuals. Compared with healthy individuals, a statistically significant increase was observed in both drug-dependent ($p<0.001$, $t=19.90$) and alcohol-dependent individuals ($p<0.001$, $t=16.51$). The difference between these groups was also statistically significant ($p<0.001$, $t=7.60$).

The results for S. pyogenes are particularly noteworthy. This microorganism was not detected in healthy individuals. In drug-dependent individuals, the mean value was 983 ± 281 CFU/mL (0–5,500), whereas in alcohol-dependent individuals it was 4,483 ± 119 CFU/mL (2,300–5,550). The value was statistically significantly higher in alcohol-dependent individuals than in drug-dependent individuals ($p<0.001$, $t=10.99$).

For Moraxella catarrhalis, the mean value was 835 ± 31 CFU/mL (100–1,000) in healthy, 16,197 ± 1,858 CFU/mL (1,000–39,900) in drug-dependent, and 21,817 ± 1,862 CFU/mL (2–39,900) in alcohol-dependent individuals. A statistically significant difference was found between drug-dependent and healthy individuals ($p<0.001$, $t=7.45$) and between alcohol-dependent and healthy individuals ($p<0.001$, $t=9.28$). The difference between drug-dependent and alcohol-dependent individuals was not statistically significant ($p=0.354$, $t=2.14$).

For S. aureus, the mean value in healthy individuals was only 130 ± 7 CFU/mL (50–200), whereas it was 67,595 ± 2,762 CFU/mL (15,200–98,000) in drug-dependent and 277,262 ± 11,626 CFU/mL (120,100–390,110) in alcohol-dependent individuals. A highly statistically significant difference was found between drug-dependent and healthy individuals ($p<0.001$, $t=17.15$) and between alcohol-dependent and healthy individuals ($p<0.001$, $t=15.72$). The value was also statistically significantly higher in alcohol-dependent than in drug-dependent individuals ($p<0.001$, $t=13.98$).

For S. epidermidis, the mean value was 877 ± 16 CFU/mL (700–1,000) in healthy, 79,040 ± 1,400 CFU/mL (60,000–99,900) in drug-dependent, and 88,781 ± 1,318 CFU/mL (67,800–99,900) in alcohol-dependent individuals. Statistically significant differences were found between healthy and drug-dependent individuals ($p<0.001$, $t=29.70$), between healthy and alcohol-dependent individuals ($p<0.001$, $t=29.35$), and between drug-dependent and alcohol-dependent individuals ($p<0.001$, $t=5.15$). Thus, S. epidermidis was markedly increased in both dependence groups, with the level in alcohol-dependent individuals being statistically significantly higher than that in drug-dependent individuals.

One of the most pronounced changes was observed for S. haemolyticus. The mean quantity of this microorganism was 91 ± 2 CFU/mL (70–110) in healthy, 812,567 ± 13,205 CFU/mL (689,000–990,100) in drug-dependent, and 7,984,492 ± 214,910 CFU/mL (5,689,000–9,990,000) in alcohol-dependent individuals. Statistically significant differences were found between healthy and drug-

dependent individuals ($p<0.001$, $t=31.59$), between healthy and alcohol-dependent individuals ($p<0.001$, $t=20.70$), and between the two dependence groups ($p<0.001$, $t=20.67$). Thus, the quantity of S. haemolyticus was particularly high in alcohol-dependent individuals.

For S. hominis, the mean value was 5,024 ± 70 CFU/mL (4,000–5,600) in healthy, 848,986 ± 16,797 CFU/mL (535,550–995,200) in drug-dependent, and 920,345 ± 11,065 CFU/mL (675,100–995,200) in alcohol-dependent individuals. In both dependence groups, the difference compared with healthy individuals was highly statistically significant, both among drug-dependent individuals ($p<0.001$, $t=27.76$) and among alcohol-dependent individuals ($p<0.001$, $t=33.19$). The value was statistically significantly higher in alcohol-dependent individuals than in drug-dependent individuals ($p=0.007$, $t=3.56$).

S. cohnii was not detected in healthy individuals, whereas it was detected at 8,774 ± 387 CFU/mL (1,000–10,000) in drug-dependent individuals and at 920 ± 345.3 CFU/mL (675,100–995,200) in alcohol-dependent individuals. S.capitis was not detected in healthy individuals, whereas the mean value was 844 ± 25 CFU/mL (100–1,000) in drug-dependent and 907 ± 22 CFU/mL (100–1,000) in alcohol-dependent individuals. No statistically significant difference was found between drug-dependent and alcohol-dependent individuals ($p=0.655$, $t=1.87$).

For S. xylosus, the mean value in the healthy group was 780.1 ± 28.725 CFU/mL. In drug-dependent individuals, the quantity of S. xylosus was 7,406 ± 215 CFU/mL (4,500–9,800), whereas in alcohol-dependent individuals it was 3,432 ± 204 CFU/mL (1,000–8,000). Statistically significant differences were found between healthy and drug-dependent individuals ($p<0.001$, $t=13.41$), between healthy and alcohol-dependent individuals ($p<0.001$, $t=13.45$), and between drug-dependent and alcohol-dependent individuals ($p<0.001$, $t=14.52$). These findings indicate that the quantity of S. xylosus was higher in drug-dependent than in alcohol-dependent individuals.

Thus, substantial changes in the quantitative characteristics of microorganisms occur in the dependence groups compared with

healthy individuals. The most pronounced changes were observed for Staphylococcus spp., Streptococcus spp., and their individual species. In particular, the levels of S. haemolyticus, S. aureus, S. epidermidis, and S. hominis were notable for increases of hundreds or even thousands of times compared with healthy individuals. In alcohol-dependent individuals, the quantities of several microorganisms were also higher than those observed in drug-dependent individuals. This pattern was particularly evident for Staphylococcus spp., Streptococcus spp., Micrococcus spp., Neisseria spp., S. aureus, S. epidermidis, S. haemolyticus, and S. hominis.

The results of the study were summarized, and an identification algorithm was developed based on the microbiological composition of the skin, blood, nasopharyngeal contents, and saliva.

The first module of the algorithm, based on the results of the bacteriological examination of the skin microbiome, makes it possible to identify whether the individual from whom the biological material was obtained has a harmful habit. Specifically, Absidia and Cryptococcus were detected only in the skin of drug-dependent individuals. The detection of these fungal genera during examination may provide grounds for a strong inference that the individual is drug-dependent.

In the second module of the algorithm, based on the composition of the blood, the detection of Staphylococcus aureus, C. tropicalis, Candida albicans, or Cryptococcus makes it possible to infer with a high degree of confidence that the individual is either drug-dependent or alcohol-dependent. This is because these strains are detected at a high frequency in individuals with both types of harmful habits.

In the nasopharyngeal contents, the detection of S. pyogenes makes it possible to infer with a high degree of probability that the individual from whom the material was obtained is drug-dependent. However, the detection of Staphylococcus spp. in the nasopharyngeal contents makes it possible to infer that the individual has either of the two harmful habits.

In the final module, it is possible to draw an inference about the individual from whom the sample was obtained based on the

microbiological composition of saliva. The detection of Streptococcus mitis or Corynebacterium spp. makes it possible to infer that the individual is drug-dependent.

Thus, based on the microbiological and mycological findings obtained, the identification of drug-dependent individuals can be performed more rapidly and accurately. However, achieving a higher degree of accuracy in the identification of alcohol-dependent individuals is relatively more difficult, because the strains associated with alcohol-dependent individuals are also detected in drug-dependent individuals.

Thus, the study findings demonstrate that, compared with healthy individuals, those with harmful habits, particularly drug-dependent individuals, exhibit a higher degree of microbial colonization in the contents of the nasopharyngeal tract. This not only poses a significant threat to the lives of these individuals but may also be used as relevant information in forensic medicine.

The study demonstrated that the microflora of the skin and nasopharyngeal mucosa in drug-dependent and alcohol-dependent individuals differs from that of healthy individuals in terms of species composition. The integration and application of findings from studies of the microbiome of different human body sites into forensic medicine may provide a basis for future developments in this field. Drug-dependent and alcohol-dependent individuals are exposed to a greater variety of potentially hazardous microorganisms, with a higher frequency of occurrence of potentially hazardous strains observed among drug-dependent individuals.

CONCLUSIONS

1. According to the anamnestic data, among unemployed drug-dependent individuals, 32.6% had a history of drug use for 10–15 years. Among employed drug-dependent individuals, this figure was 11.6%, whereas a duration of drug use of 6–10 years was reported in 27.9% of unemployed individuals. Among the clinical symptoms observed in drug-dependent individuals, hand tremor was the most

frequent, occurring in 60.5% of cases. Insomnia was recorded in 58.1% of individuals, elevated arterial blood pressure in 53.5%, skin discoloration in 46.5%, and fatigue in 39.5%. Among drug-dependent individuals, impaired memory and attention, speech difficulties, and behavioral disturbances were also frequently observed, accounting for 53.5% of cases. Hand tremor was the predominant clinical symptom among drug-dependent individuals, occurring in 60.5% of cases. Among alcohol-dependent individuals, moderate, mild, and severe degrees of alcoholism were recorded in 43.8%, 29.2%, and 27.1% of cases, respectively. Among the clinical symptoms observed in alcohol-dependent individuals, elevated arterial blood pressure was the most frequent, occurring in 37.5% of cases, followed by skin discoloration in 33.3%, insomnia in 31.3%, and fatigue in 29.2%. Among alcohol-dependent individuals, speech difficulties were recorded in 41.7% of cases, impaired memory in 37.5%, behavioral disturbances in 27.1%, and anxiety and agitation in 18.8%. Among concomitant somatic pathologies in drug-dependent individuals, neurological and psychiatric disorders were the most frequent, accounting for 34.9% of cases, followed by gastrointestinal diseases (20.9%), respiratory system diseases (18.6%), and endocrine disorders (11.6%). In alcohol-dependent individuals, cardiovascular diseases predominated among the concomitant somatic pathologies, accounting for 33.3% of cases. Gastrointestinal diseases were observed in 27.1% of cases, endocrine disorders in 20.8%, and neurological and psychiatric disorders and respiratory system diseases in 16.7% each [5, 7, 10, 14, 16].

2. Candida albicans was the most frequently detected microorganism (46.5%). In alcohol-dependent individuals, Candida tropicalis was the most frequently detected microorganism (47.9%). The statistical differences in the blood microbiological parameters between the study groups were highly significant. The only exception was Enterobacteriaceae spp., which was more frequent in drug-dependent individuals than in alcohol-dependent individuals, but the difference was not statistically significant ($p=0.0104$, $p<0.001$, $t=2.63$). M. Catarrhalis was also more frequent in drug-dependent

individuals than in alcohol-dependent individuals, but the difference was not statistically significant ($p=0.0354$, $p<0.001$, $t=2.14$). S. capitis, whose level was likewise higher in drug-dependent than in alcohol-dependent individuals, but the difference was not statistically significant ($p=0.0655$, $p<0.001$, $t=1.87$) [1, 3, 9].

3. According to the study findings, the prevalence of several microorganisms in the oral microbiome of drug-dependent individuals was statistically significantly higher than in healthy individuals. In particular, Staphylococcus epidermidis was detected in 81.4% of drug-dependent individuals compared with 29.0% of healthy individuals ($p<0.001$; $\chi^2=20.49$), Staphylococcus aureus in 76.7% compared with 32.3% ($p<0.001$; $\chi^2=14.64$), Streptococcus mitis in 86.0% compared with 48.4% ($p<0.001$; $\chi^2=12.23$), and Streptococcus pyogenes in 72.1% compared with 22.6% ($p<0.001$; $\chi^2=17.68$). Pseudomonas aeruginosa was detected in 65.1% of drug-dependent individuals compared with 19.4% of healthy individuals, and the difference was statistically significant ($p<0.001$; $\chi^2=15.19$). Clostridium spp. was not detected in healthy individuals but was identified in 72.1% of drug-dependent individuals ($p<0.001$; $\chi^2=38.46$). No statistically significant differences between the groups were found for Corynebacterium spp. (86.0% vs. 77.4%; $p=0.336$) or Acinetobacter spp. (81.4% vs. 67.7%; $p=0.177$) [2, 4, 12].

4. The microbiome of the nasopharyngeal tract in the study groups was significantly altered compared with that of healthy individuals, with a marked increase in the microbial load. High levels of microorganisms such as Staphylococcus spp. (884,475 ± 13,834 CFU/mL) and Streptococcus spp. (771,613 ± 16,470 CFU/mL) were observed in alcohol-dependent individuals. At the same time, these values were even higher in drug-dependent individuals: Staphylococcus spp. reached 8,090,328 ± 173,543 CFU/mL, while Streptococcus spp. reached 6,377,805 ± 188,014 CFU/mL. At the same time, high concentrations of opportunistic pathogens such as Micrococcus spp. (1,030,716 ± 185,853 CFU/mL) and S. haemolyticus (7,984,492 ± 214,909 CFU/mL) were also recorded in drug-dependent individuals. Among the microorganisms detected at lower levels, Neisseria spp.

(671.4 ± 23.2 CFU/mL), S. pyogenes (448.2 ± 11.8 CFU/mL), and S. capitis (90.7 ± 2.2 CFU/mL) were identified. Comparative analysis showed that although the microbiome structure was similar in alcohol-dependent and drug-dependent individuals, the level of microbial contamination was higher in drug-dependent individuals. Statistically significant differences were identified between the groups for almost all microorganisms ($p<0.001$) [8, 15].

5. In alcohol-dependent individuals, C. tropicalis was detected in 47.9% of cases and was statistically significantly more frequent than in healthy individuals ($p=0.0041$, $p>0.005$, $\chi^2=8.23$). Analysis of the skin microbiology demonstrated a high prevalence of fungal infections among drug-dependent individuals, particularly Cryptococcus (74.4%), Candida albicans (51.2%), and Candida tropicalis (44.2%). Changes in the fungal flora were also observed among alcohol-dependent individuals. However, these changes were less pronounced than those observed in drug-dependent individuals. In this group, Candida tropicalis (47.9%) and Candida albicans (45.8%) predominated, whereas Cryptococcus was detected in 37.5% of cases [6, 11, 13, 16].

6. The identification of drug-dependent and alcohol-dependent individuals has been scientifically substantiated based on a comprehensive analysis of microbiological and mycological parameters across different biological materials. According to the first module of the algorithm, the detection of fungal strains such as Absidia in the skin microbiome provides a high probability of indicating drug use and may be considered a specific marker for the identification of drug-dependent individuals. According to the second module, the detection of Staphylococcus aureus, Candida albicans, Candida tropicalis in the microbiological composition of blood represents a common feature among individuals with harmful habits and allows a well-founded inference that the individual is either drug-dependent or alcohol-dependent. The third module, based on the analysis of nasopharyngeal contents, indicates that the detection of S. pyogenes is more characteristic of drug-dependent individuals, whereas the presence of Staphylococcus spp. is widespread among

individuals with both types of harmful habits. In the final module, evaluation of the oral microbiome (saliva) shows that the detection of Streptococcus mitis and Corynebacterium spp. may serve as indicators associated with an increased likelihood of drug use [1, 3, 4].

PRACTICAL RECOMMENDATIONS

1. When human biological materials are used as evidence, it is advisable to perform microbiological examinations of these materials.

2. Given the marked differences in the microbiological composition of biological materials such as skin, nasopharyngeal contents, saliva, and blood compared with those of healthy individuals, these materials may be used for the identification of individuals with harmful habits.

3. The detection of Rhizopus, Absidia, Cryptococcus, C. Krusei, Aspergillus, Penicillium, P. notatum in skin specimens; Staphylococcus aureus, Staphylococcus epidermidis, and Klebsiella pneumoniae in blood; and S. pyogenes and S. capitis in nasopharyngeal contents may raise suspicion that the individual has harmful habits, while high levels of these microorganisms may raise suspicion of drug dependence.

LIST OF PUBLISHED SCIENTIFIC WORKS ON THE DISSERTATION TOPIC

1. M.H.Əliyev, N.C.Cahangirli. Məhkəmə-tibbi ekspertizasında kompleks mikrobioloji müayinələrin mahiyyəti və dəlillərin əhəmiyyəti // - Bakı: Azərbaycan təbabətinin müasir nailiyyətləri, – 2024, №2, – s.33-37.
2. M.H.Əliyev, C.N.Cahangirli. Narkoman və alkohol aludəçiləri arasında ağız boşluğu mikroflorasının xüsusiyyətləri // – Bakı: Sağlamlıq, elmi-praktik jurnal, – 2024, Cilid 32, №3, – s.16-22.
3. C.N.Cahangirli. Zərərli vərdişləri olan şəxslərdə qan mikrobiomunun xarakterik xüsusiyyətləri // – Bakı: İctimai sağlamlıq, – 2024. №2, – s.88-93
4. М.Г.Алиев, Д.Н.Джахангирли. Современное состояние и перспективы применения микробиологических исследований слюны у наркозависимых пациентов // – Bakı: Azərbaycan Tibb Jurnalı, rüblük elmi-praktik jurnal, – 2024. №4, – s. 110-115.
5. C.N.Cahangirli. Narkotik istifadəçilərinin klinik-psixoloji parametrlər üzrə əsas xarakterik cəhətlərinin təhlili // – Bakı: «Tibb və Elm», Əziz Əliyev adına elmi-praktik jurnal, – 2024. №2 (36), – s. 24-27.
6. C.N.Cahangirli. Zərərli vərdişləri olan şəxslərdə dəri örtüyü mikrobiomunun mikoloji xüsusiyy. ətlərinin müqayisəli təhlili // – Bakı: Nəzəri, Klinik və Eksperimental Morfologiya Jurnalı, – 2025. Cild 5, № 1, – s.32-36.
7. Д.Н.Джахангирли. Сравнительный анализ клинико-психологических симптомов и сочетанных соматических патологий у лиц с вредными привычками // СибАК. Естественные науки и медицина: теория и практика. LXXXIII международная научно-практическая конференция, Новосибирск, – Июнь №6(60), 2025, – с.113-118
8. J.N.Jahangirli. Bacteriological research methods as one of the promising areas of development of forensic microbiological

examination // – Полтава: Вісник проблем біології і медицини, – 2024, Вип. 3 (174), – s.257-263.
9. C.N. Cihangirli. Uyuşturucu bağimlilari ve alkoliklerde kanin mikrobiyolojik inceleme sonuçlari // 6.International liberty Interdisciplinary studies Conference, New York, – November 29-30, 2024, – p.560-564.
10. C.N. Cahangirli. Alkohol aludəçilərinin sağlamlığının bəziklinik-psixoloji parametrlər üzrə təhlili // Milli Nevrologiya jurnalı, elmi-praktik jurnal, – Bakı, 16-21 Dekabr 2024, № 2 (26), s.129-130.
11. C.N. Cahangirli. Alkohol qəbul edən şəxslər və narkomanlarda dərinin göbələk örtüyünün xarakterik xüsusiyyətləri // Əzəm Ağayev, 80 illik yubilyenə həsr edilmiş elmi konfrasın materialları, – Bakı: 2024, – s.91-92.
12. Д.Н.Джахангирли. Возможности бактериологических методов исследований у наркозависимых пациентов // Научный форум: медицина, биология и химия Сборник статей по материалам LXXII международной научно-практической конференции, – Москва, Ноябрь 2024, № 9 (72), s.60-63.
13. Д.Н. Джахангирли. Возможности бактериологических методов исследований у наркозависимых пациентов // Science and technology research - 2024 Сборник статей III Международной научно-практической конференции. – Петрозаводск, – 10 октября 2024, – s.82-86.
14. C.N. Cahangirli. Zərərli vərdişləri olan şəxslərdə müştərək somatik patologiyaların strukturu // Ə.Əliyev adına Azərbaycan Dövlət Həkimləri Təkmilləşdirmə İnstitutunun 90 illiyinə həsr olunmuş beynəlxalq elmi-praktiki konqresin məcmuəsi, – 2025, s.35-36
15. J.N. Jahangirli. The importance of microbiological parameters of individuals with harmful habits in forensic medicine // 9th International Conference on Medical Health Sciences, Conference proceedings book, Dubai, UAE, June 10, 2025**,** – p.1070-1075.

16. J.N.Jahangirli Prevalence of cardiovascular diseases in the clinical assessment of alcohol-dependent patients // The Turkic World Congress on Cardio-Oncology. The first international Aİ and Robotic Cardiology Summit. Historical Special Edition Abstracts. – Baku, 20-22 may, – 2026, – p. 91



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