

## **Structural and Functional Changes in the Breast under the Influence of Energy Drinks in the Experiment**

**Elvina Sharipova M., Riboba Sharipova G.**

Bukhara state medical institute, Department of Clinical pharmacology, Uzbekistan

**Abstract:** Breast cancer confidently ranks first in the structure of oncological diseases among women. The number of newly diagnosed cases is growing every year. Interestingly, women living in megacities suffer from tumors more often than women living in rural areas do. In Uzbekistan, more than 3,000 cases of this disease are detected annually. However, given that not all patients go to doctors, choosing treatment from healers, the true figures can reach 4,000-5,000 cases. In the article, we reveal this problem and more thoroughly study the causes of the development of this pathology, as well as morphologically consider the influence of energy drinks in the experiment.

**Keywords:** breast pathology, energy drink, addiction.

### **Introduction**

Breast diseases are the most common group of diseases among the female population. They are benign and malignant, that is, oncological. Of the benign ones, mastopathy, mastitis, mastodynia, and chest injuries most often occur. Malignant diseases include breast cancer, which affects modern women more and more often [3; 10; 16].

According to the World Health Organization, more than 10 million new cases of breast cancer are registered every year. After 2020, this figure will gradually increase, reaching 15,000,000. More than 6 million women per year die from the destructive effects of tumors. The stable growth of newly diagnosed oncological diseases has been going on for more than 20 years [4; 8; 9; 23; 38].

In Europe, more than 370,000 new cases of breast cancer are diagnosed every year, and approximately 130,000 women die from them [3, 4, 14].

The number of patients with malignant breast pathology is increasing every year. In women, this pathology occupies a leading position in the structure of oncological morbidity. According to statistics, more than 1,500,000 women worldwide suffer from this pathology and the number of such patients is steadily growing. Approximately 1,250,000 new cases of the disease are registered annually, of which 57,000 breast cancer patients were diagnosed in Russia in 2010, and more than 68,500 new cases in 2016 [3; 9; 22; 34].

When a woman is faced with a disease such as breast cancer, it always causes shock, fear for her own life, the life of her children, and for young women, the fear of losing sexual attractiveness and a ban on motherhood comes first. Necessary neoadjuvant (preoperative chemotherapy) and adjuvant (postoperative) therapy can significantly change a woman's life and her daily activities [3; 10; 17; 31].

Breast cancer is the most common type of cancer, with over 2.2 million cases reported in 2020 [2; 19; 33; 20].

During her lifetime, approximately one in twelfth women will experience breast cancer. Breast cancer is the leading cause of cancer death in women. In 2020, approximately 685,000 women died from this disease [4, 12; 19; 27].

Most breast cancer cases and deaths occur in low- and middle-income countries.

There are significant differences between high-income and low-income countries in rates associated with breast cancer [4; 12; 32].

Breast cancer occurs in the lining cells (epithelium) of the milk ducts (85%) or lobules (15%) of the glandular breast tissue. Initially, tumor growth is limited to the duct or lobule (preinvasive cancer, "cancer in situ" - in situ), where it does not cause any symptoms and has minimal potential for the formation of secondary foci of tumor growth (metastasis) [18; 37].

Over time, these pre-invasive malignancies (stage 0 or cancer in situ) can grow and invade more breast tissue (invasive breast cancer) and then spread to nearby lymph nodes (regional metastasis) and to other organs (distant metastasis). ). If a woman dies from breast cancer, then this is due to extensive metastasis [18; 26; 36].

In 2020, 2.3 million women were diagnosed with breast cancer and 685,000 deaths from the disease were reported worldwide. As of the end of 2020, 7.8 million women still alive had been diagnosed with breast cancer over the past five years, which means that this type of cancer is the most common cancer in the world. The number of healthy life years (DALYs) lost by women with this diagnosis in the world exceeds that of any other type of cancer in women. Breast cancer occurs in all countries of the world in women of any age after reaching puberty, but at an older age, the incidence increases [1, 11; 29].

The nature of human nutrition has also changed radically. Especially quickly, the nature of human nutrition began to change over the past century. In the last 20–30 years, due to the fantastic development of technology, food products in most respects have ceased to correspond to the natural “standards” to which our body is genetically tuned. This is a very important circumstance [2; 5; 11; 25].

The fact is that, according to the latest scientific data, the human body in the process of evolution is genetically tuned in to the use of certain natural substances of plant and animal origin as food. For example, meat of domestic animals and poultry, produced according to modern industrial technologies using special feeds, food additives (hormones, antibiotics, premixes, growth stimulants, etc.), can hardly be called a useful product. In such meat, as a rule, there is an excess of fats and cholesterol, at the same time, despite feed additives, the content of nutrients, especially minerals and vitamins, is most often sharply reduced. Along with this, meat from livestock complexes is constantly found carcinogens (dioxin, benzopyrene, etc.), herbicides and pesticides, mineral fertilizers, extremely toxic heavy metals (mercury, lead, and cadmium), radioactive isotopes, antibiotics, hormones, bacterial and fungal toxins, and a host of other very dangerous compounds. Many harmful substances are the strongest oxidizing agents, the so-called free radicals, which destroy body cells and their genetic apparatus and lead to accelerated aging and the development of oncological diseases, including breast diseases [1, 3, 10].

The problem of preserving and improving the health of the population of Uzbekistan is a priority of the state. In recent years, there has been a steady trend towards the use of functional nutrition for prevention and treatment [24; 35].

Energy drinks (energy tonics, energy drinks) are a new brand in a number of bad habits, along with alcohol, tobacco and drugs. It was in this historical sequence that these phenomena appeared in the life of humankind. Unlike the first three, energy drinks and the mechanism of their effect on the human body have not been studied enough. The psychological connection “energy = evil” has not yet become entrenched in the consciousness of society, this relationship is not obvious and not as pronounced as in the case of alcohol [3, 2,].

So, without exception, all "energy" contain caffeine. Another component of energy cocktails is taurine. The addiction to energy drinks lies in the properties of their main component - caffeine. Large doses of caffeine can lead to nerve cell depletion. The action of caffeine (as well as other psychostimulants) largely depends on the type of higher nervous activity. Caffeine weakens the effect of sleeping pills and narcotic drugs, increases the reflex excitability of the spinal cord, and excites the respiratory and vasomotor centers. Cardiac activity under the influence of caffeine increases, myocardial contractions become more intense and become more frequent. In the amount contained in 2-3 jars of energy tonic, drunk for a short time, caffeine causes anxiety, insomnia, irritability and headaches. However, although it has not yet been fully proven, caffeine consumption in high doses over a long period of time can cause coronary heart disease, high blood pressure, and some birth defects in offspring [4; 9; 30].

Acute caffeine poisoning produces early symptoms of anorexia, tremors, and confusion. Severe intoxication can cause delirium, convulsions, supraventricular and ventricular tachyarrhythmia, hypokalemia and hyperglycemia. Chronic use of high doses of caffeine can lead to nervousness, irritability, anger, constant tremors, muscle twitches, insomnia, and hyperreflexia. Taurine is a synthetic analogue of caffeine, which is cheaper and is added to energy drinks in large quantities [5; 28].

Most of the expert opinions of medical specialists clearly state the harmful effects of such drinks on human health. However, the only thing that specialists and society have managed to achieve today is the mandatory application of warning labels on banks. A number of studies also unequivocally link the use of energy drinks and soft alcoholic drinks with a future addiction to hard alcoholic drinks and so-called "hard" drugs. The allowable daily intake of caffeine is less than 150 mg, and in energy drinks, its content usually ranges from 150 to 320 mg/l. This is the upper acceptable daily intake level. With many people drinking more than one pack of tonic drinks per day, and the energy drinks themselves are available in packages of 250 ml or more, such abuse of tonic drinks can lead to detrimental health effects, especially for adolescents, pregnant and lactating women. , people suffering from acquired diseases of the nervous, cardiovascular systems, hypertension and other diseases [6; 7; ]. To date, the intake of alcoholic and non-alcoholic beverages affects the occurrence, development, spread to other parts of the body, and even the outcome of breast cancer. Of course, other factors also influence this process, but now it is still customary to put the diet in the first place. Efforts are on the rise to unravel the intricate ways in which alcohol and non-alcoholic beverages affect cellular processes, especially those involving estrogen, which regulates breast disease.

### **Purpose of the study**

The purpose of this study is to study the structural changes in the mammary gland during acute and chronic exposure to the energy drink in rats of different ages, to use a biological correction method using flaxseed oil to reduce the effect of the energy drink on the mammary gland, and to study laboratory and diagnostic analysis.

### **Materials and methods of research**

The object of the laboratory experiment were 90 outbred mature rats 3, 6 and 9 months of age, which were in absolutely the same conditions and ate a balanced diet, drinking water was supplied to all experimental animals 2 times a day. All observed animals were divided into 4 comparable groups. The experiment consisted in the supply of an energy drink, which was fed to the animals through a tube for 90 days at a dose of 1.1 ml/100 g, located in a special box. The animals were divided into groups: the intact group consisted of 30 rats that were not exposed to the energy drink, the remaining 60 rats of 3, 6 and 9 months of age made up the experimental group. 3-month-old rats were injected with the amount of energy drink at a dose of  $2 \text{ ml} \pm 0.1 \text{ ml}$ , 6-month-old rats -  $4 \text{ ml} \pm 0.1 \text{ ml}$ , 9-month-old rats -  $6 \pm 0.1 \text{ ml}$ .

## Results and its discussion

Morphological and morphometric study of breast tissue and regional lymph nodes (axillary) were carried out at different stages of the formation of pneumosclerosis: 30, 60 and 90 days.

The analysis of the results of the study showed that because of the impact of the energy drink on the 60th day, signs of inflammation were evident in the biomaterial obtained from the mammary gland, with the presence of inflammatory and diffuse infiltrates, consisting mainly of neuro- and eosinophilic granulocytes.

Morphological examination of the mammary gland at the age of 3 months revealed leukocyte infiltration, proliferation of glandular epithelium, single macrophages and adipose tissue (Photo 1).

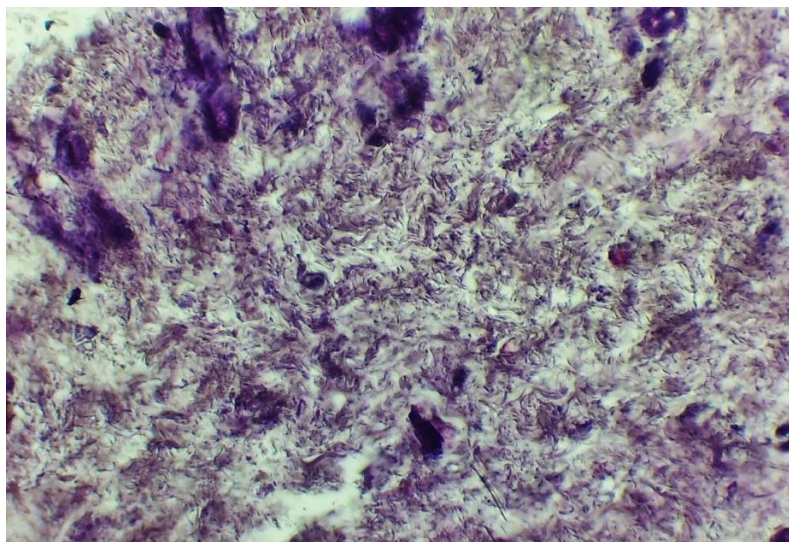


Photo 1. Leukocyte infiltration, proliferation of glandular epithelium (2), single macrophages and adipose tissue are found (3). Staining with hematoxylin-eosin. About 20x20.

Morphological examination of the mammary gland at 6 months of age revealed leukocyte infiltration, proliferation of glandular epithelium, single macrophages and adipose tissue (Photo 2).

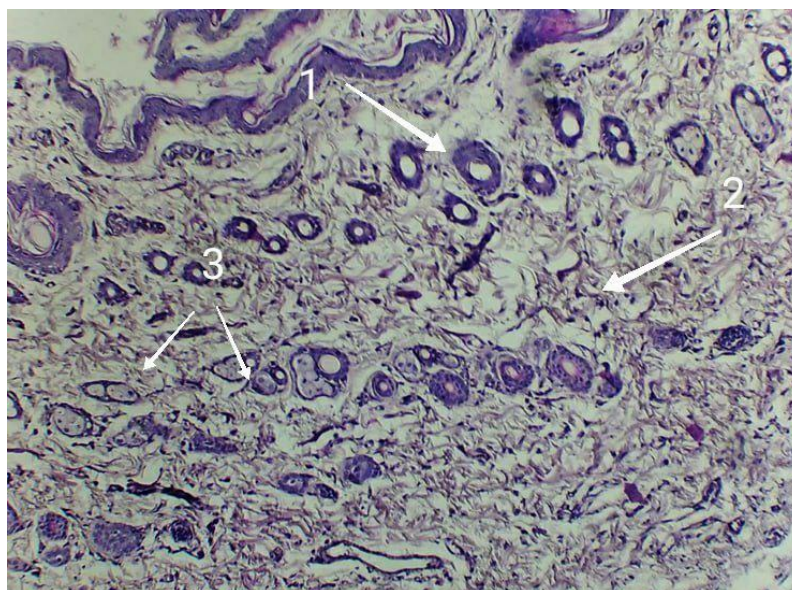


Photo 2. Glandular acini in part of the lobules are unevenly expanded, moderate proliferation of the glandular epithelium (2), single macrophages (3). Staining with hematoxylin-eosin. About 20x20

Morphological examination of the mammary gland of 9 months of age revealed leukocyte infiltration, proliferation of glandular epithelium, single macrophages and adipose tissue (Photo 3).

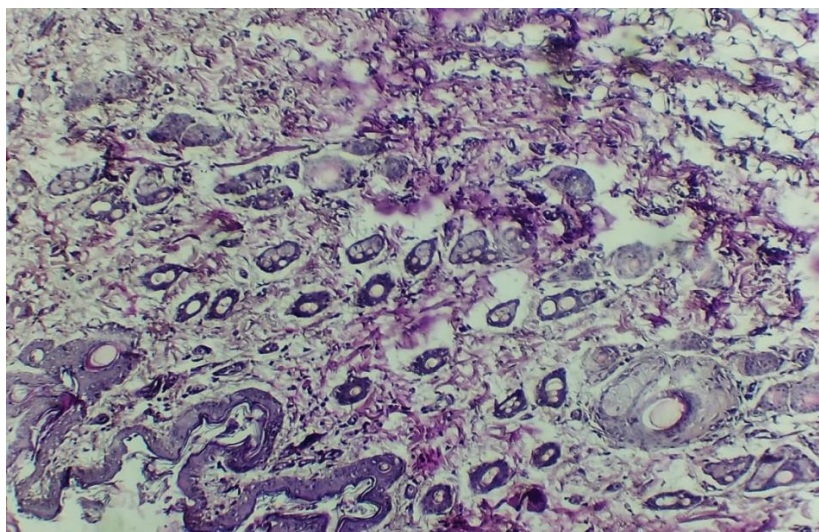


Photo 3. Leukocyte infiltration moderate proliferation of glandular epithelium. In some areas, hyperplasia of the glandular structures of the ducts with a pronounced proliferation of the myoepithelium is revealed. Hematoxylin-eosin staining. About 20x20

### Conclusions

From the obtained results of the research, it can be concluded that changes in the mammary glands, caused by the experimental influence of the energy drink, become more pronounced with the age of the studied rats.

### References

1. Ahrorovna, K. D. (2021). Evaluation of the effect of a genetically modified product on the morphological parameters of the spleen of experimental animals. *ACADEMICIA: AN INTERNATIONAL MULTIDISCIPLINARY RESEARCH JOURNAL*, 11(1), 885-888.
2. Tkachenko A.V., Makovkina D.V. IMPACT OF ENERGY DRINKS ON YOUTH HEALTH // "Health and education in the XXI century" Moscow 2017. Volume 19 (12); pp. 274-276.
3. Khudaikulov T.K., Khudaikulov A.T. INCIDENCE OF BREAST CANCER IN UZBEKISTAN. // *POVOLZHSK ONCOLOGICAL BULLETIN*. 2016; 2(24):38-42.
4. KHUDAIKULOV A.T., KHUDAIKULOV T.K. Socio-economic consequences of female mortality from breast cancer in Uzbekistan. // *Journal "Malignant tumors"* 2015. Pp. 53-56
5. Khasanova D. Study of the carcinogenic properties of genetically modified products on the morphology of the spleen. – 2021.- P.47-48.
6. Khasanova, D. A. (2021). POSSIBLE RISKS OF THE EXPOSURE OF GENE-MODIFIED PRODUCTS ON THE THYMUS AND SPLEEN OF EXPERIMENTAL ANIMALS. *INNOVATIVE DEVELOPMENT: THE POTENTIAL OF SCIENCE AND MODERN EDUCATION* (pp. 279-287).
7. Khasanova D. A. Morphological Peculiarities Of The Spleen In Normality And With The Influence Of A Gene-Modified Product In Experiment // *The American Journal of Medical Sciences and Pharmaceutical Research*. – 2021. – T. 3. – №. 04. – C. 26-30.
8. Khasanova, D. A. (2021). MORPHOFUNCTIONAL CHANGES IN THYMUS GLAND OF RATS EFFECTED BY GENETICALLY ENGINEERED CROPS. In *ADVANCED RESEARCH: PROBLEMS AND NEW APPROACHES* (pp. 120-125).

9. Nasirova S.Z., Norova N.K., Samadov A.T. Change of morphometric parameters of the lymphoid tissue of the small intestine on polypharmacy with anti-inflammatory agents // Topical issues of new medicines developmen. - Харків, 2021. - 18-19 march. - P.309-310.
10. Dilmurod K. et al. Structural changes in regional lymph nodes in experimental pulmonary fibrosis //Central Asian Journal of Medical and Natural Science. – 2022. – Т. 3. – №. 3. – С. 488-494.
11. Midkhatovna S. E. PRECLINICAL ATHEROSCLEROSIS IN YOUNG MEN WITH METABOLIC SYNDROME AND THE POSSIBILITY OF ITS PRIMARY PREVENTION //EUROPEAN JOURNAL OF MODERN MEDICINE AND PRACTICE. – 2022. – Т. 2. – №. 2. – С. 30-34.
12. Midkhatovna S. E. Efficacy and safety of lipid-lowering drugs as primary and secondary prevention of cardiovascular diseases in the elderlyin the uzbekistan //International Journal of Culture and Modernity. – 2022. – Т. 13. – С. 68-75.
13. Sharipova E. M., Sharipova R. G. Digital Pedagogy In The Educational Process of Pharmacology //American Journal of Language, Literacy and Learning in STEM Education (2993-2769). – 2023. – Т. 1. – №. 7. – С. 82-86.
14. Шарипова Э. М. ЭФФЕКТИВНОСТЬ МАСЛА ГРАНАТОВЫХ КОСТОЧЕК НА РЕГИОНАРНЫЕ ЛИМФАТИЧЕСКИЕ УЗЛЫ ЛЁГКИХ ПРИ ЭКСПЕРИМЕНТАЛЬНОМ ПНЕВМОСКЛЕРОЗЕ //Издается по решению редакционно-издательского совета ФГБОУ ВО КГМУ Минздрава России. – 2022. – С. 190.
15. Шарипова Э. М. Изучение Гепатопротективного Свойства Биологически Активной Добавки «Гепанорм» //Central Asian Journal of Medical and Natural Science. – 2023. – Т. 4. – №. 2. – С. 63-67.
16. Sharipova E. M., Orzieva O. Z. Non-Organic Benign Tumors: Fibromas //Research Journal of Trauma and Disability Studies. – 2023. – Т. 2. – №. 3. – С. 7-14.
17. Шарипова Э. М. Роль Цифровой Педагогики В Учебном Процессе По Предмету Фармакологии //Central Asian Journal of Medical and Natural Science. – 2023. – Т. 4. – №. 3. – С. 494-498.
18. Шарипова Э. М. Неорганные Доброкачественные Опухоли: Фиброма //Miasto Przyszłości. – 2022. – Т. 25. – С. 377-379.
19. Шарипова Э. М. и др. ФАРМАКОЛОГИЧЕСКИЕ СВОЙСТВА РАСТИТЕЛЬНОГО ЛЕКАРСТВЕННОГО СРЕДСТВА ПЛОДОВ БОЯРЫШНИКА, ЕГО ГИПОТЕНЗИВНОЕ ДЕЙСВИЕ ПРИ КОМПЛЕКСНОЙ ТЕРАПИИ //ЎТІМОЇУ FANLARDA INNOVASIYA ONLAYN ILMIY JURNALI. – 2022. – С. 114-117.
20. Dilmurod K. et al. Structural changes in regional lymph nodes in experimental pulmonary fibrosis //Central Asian Journal of Medical and Natural Science. – 2022. – Т. 3. – №. 3. – С. 488-494.
21. Midkhatovna S. E. PRECLINICAL ATHEROSCLEROSIS IN YOUNG MEN WITH METABOLIC SYNDROME AND THE POSSIBILITY OF ITS PRIMARY PREVENTION //EUROPEAN JOURNAL OF MODERN MEDICINE AND PRACTICE. – 2022. – Т. 2. – №. 2. – С. 30-34.
22. Midkhatovna S. E. Efficacy and safety of lipid-lowering drugs as primary and secondary prevention of cardiovascular diseases in the elderlyin the uzbekistan //International Journal of Culture and Modernity. – 2022. – Т. 13. – С. 68-75.

23. Sharipova, E. M., & Sharipova, R. G. (2023). Digital Pedagogy In The Educational Process of Pharmacology. *American Journal of Language, Literacy and Learning in STEM Education* (2993-2769), 1(7), 82-86.
24. Шарипова, Э. М. (2022). ЭФФЕКТИВНОСТЬ МАСЛА ГРАНАТОВЫХ КОСТОЧЕК НА РЕГИОНАРНЫЕ ЛИМФАТИЧЕСКИЕ УЗЛЫ ЛЁГКИХ ПРИ ЭКСПЕРИМЕНТАЛЬНОМ ПНЕВМОСКЛЕРОЗЕ. *Издается по решению редакционно-издательского совета ФГБОУ ВО КГМУ Минздрава России*, 190.
25. Sharipova R. G. COMBINED TREATMENT OF ANEMIA OF PREGNANT WOMEN: IRON-CONTAINING DRUG" FEROFORT" AND MULBERRY TINCTURE //EUROPEAN JOURNAL OF MODERN MEDICINE AND PRACTICE. – 2022. – Т. 2. – №. 7. – С. 71-76.
26. Шарипова Р. Г. Эффективность Комбинации Препарата «Ферофорт» И Настойки Тувовника При Лечении Анемии Беременных //Miasto Przyszłości. – 2022. – Т. 25. – С. 292-296.
27. Sharipova E. M., Sharipova R. G. Digital Pedagogy In The Educational Process of Pharmacology //American Journal of Language, Literacy and Learning in STEM Education (2993-2769). – 2023. – Т. 1. – №. 7. – С. 82-86.
28. Шарипова Э. М. ЭФФЕКТИВНОСТЬ МАСЛА ГРАНАТОВЫХ КОСТОЧЕК НА РЕГИОНАРНЫЕ ЛИМФАТИЧЕСКИЕ УЗЛЫ ЛЁГКИХ ПРИ ЭКСПЕРИМЕНТАЛЬНОМ ПНЕВМОСКЛЕРОЗЕ //Издается по решению редакционно-издательского совета ФГБОУ ВО КГМУ Минздрава России. – 2022. – С. 190.
29. Шарипова Э. М. Изучение Гепатопротективного Свойства Биологически Активной Добавки «Гепанорм» //Central Asian Journal of Medical and Natural Science. – 2023. – Т. 4. – №. 2. – С. 63-67.
30. Sharipova E. M., Orzieva O. Z. Non-Organic Benign Tumors: Fibromas //Research Journal of Trauma and Disability Studies. – 2023. – Т. 2. – №. 3. – С. 7-14.
31. Шарипова Э. М. Роль Цифровой Педагогики В Учебном Процессе По Предмету Фармакологии //Central Asian Journal of Medical and Natural Science. – 2023. – Т. 4. – №. 3. – С. 494-498.
32. Шарипова Э. М. Неорганические Доброкачественные Опухоли: Фиброма //Miasto Przyszłości. – 2022. – Т. 25. – С. 377-379.
33. Шарипова Э. М. и др. ФАРМАКОЛОГИЧЕСКИЕ СВОЙСТВА РАСТИТЕЛЬНОГО ЛЕКАРСТВЕННОГО СРЕДСТВА ПЛОДОВ БОЯРЫШНИКА, ЕГО ГИПОТЕНЗИВНОЕ ДЕЙСВИЕ ПРИ КОМПЛЕКСНОЙ ТЕРАПИИ //ЎТМОЎ FANLARDA INNOVASIYA ONLAYN ILMIY JURNALI. – 2022. – С. 114-117.
34. Dilmurod K. et al. Structural changes in regional lymph nodes in experimental pulmonary fibrosis //Central Asian Journal of Medical and Natural Science. – 2022. – Т. 3. – №. 3. – С. 488-494.
35. Midkhatovna S. E. PRECLINICAL ATHEROSCLEROSIS IN YOUNG MEN WITH METABOLIC SYNDROME AND THE POSSIBILITY OF ITS PRIMARY PREVENTION //EUROPEAN JOURNAL OF MODERN MEDICINE AND PRACTICE. – 2022. – Т. 2. – №. 2. – С. 30-34.
36. Midkhatovna S. E. Efficacy and safety of lipid-lowering drugs as primary and secondary prevention of cardiovascular diseases in the elderly in the uzbekistan //International Journal of Culture and Modernity. – 2022. – Т. 13. – С. 68-75.

37. Sharipova R. G. COMBINED TREATMENT OF ANEMIA OF PREGNANT WOMEN: IRON-CONTAINING DRUG" FEROFORT" AND MULBERRY TINCTURE //EUROPEAN JOURNAL OF MODERN MEDICINE AND PRACTICE. – 2022. – Т. 2. – №. 7. – С. 71-76.
38. Шарипова Р. Г. Эффективность Комбинации Препарата «Ферофорт» И Настойки Тутовника При Лечении Анемии Беременных //Miasto Przyszłości. – 2022. – Т. 25. – С. 292-296.