

Propedeutics and Problems of Internal Diseases

Inkar Serdaliyeva, Arailym Omirbayeva, Nurgul Nurmanova, Kunsulu Kenzheyeva, Gulmira Izzatullayeva

Department of Propedeutics and Internal Medicine, Khoja Akhmet Yassawi International Kazakh-Turkish University, Republic of Kazakhstan

Corresponding author: Inkar Serdaliyeva, Lecturer, Department of Propedeutics and Internal Medicine, Khoja Akhmet Yassawi International Kazakh-Turkish University. Address: 161200, 29 B. Sattarkhanov Ave., Turkestan, Republic of Kazakhstan. Phone: +7 72533 6 38 48. E-mail address: inserdaliyeva@yahoo.com. ORCID ID: <https://orcid.org/0009-0000-6516-2308>

doi: 10.5455/aim.2023.31.287-291

ACTA INFORM MED. 2023, 31(4): 287-291

Received: JUL 25, 2023

Accepted: SEP 04, 2023

© 2023 Inkar Serdaliyeva, Arailym Omirbayeva, Nurgul Nurmanova, Kunsulu Kenzheyeva, Gulmira Izzatullayeva

This is an Open Access article distributed under the terms of the Creative Commons Attribution Non-Commercial License (<http://creativecommons.org/licenses/by-nc/4.0/>) which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT

Background: Internal diseases pose a significant public health concern due to their prevalence and impact on premature mortality and disability. This study investigates the role of internal diseases in the morbidity structure of the Republic of Kazakhstan's population, focusing on the period from 2019 to 2021. **Objective:** The primary objective of this study is to assess the prevalence and dynamics of internal diseases among the adult population of the Republic of Kazakhstan during 2019-2021. **Methods:** We conducted a comprehensive analysis of medical records from healthcare facilities across the Republic of Kazakhstan for the years 2019 to 2021. The study focused on diseases of the cardiovascular system, endocrine system, metabolic disorders, respiratory system, gastrointestinal tract, and urinary system. Epidemiological indicators, including prevalence rates and morbidity, were calculated for each disease category using official population data for the same period. **Results:** Our findings indicate a noteworthy increase in the prevalence rates of internal diseases among the adult population of the Republic of Kazakhstan from 2019 to 2021. Diseases of the cardiovascular system were the most prevalent, with arterial hypertension and coronary heart disease being particularly pressing concerns. Diabetes mellitus and thyroid abnormalities were the most common endocrine organ diseases. Among respiratory diseases, bronchitis had the highest prevalence, followed by tracheitis, bronchial asthma, and pneumonia. Additionally, the prevalence of gastrointestinal tract diseases increased by 3% over two years. **Conclusion:** This study underscores the urgent need for effective prevention and management of internal diseases in the Republic of Kazakhstan. The increasing prevalence rates across all leading categories of diseases highlight significant public health concerns.

Keywords: diseases of the internal organs, diseases of the organs and systems, prevalence rate, regular medical check-up, medical research.

1. BACKGROUND

Diabetes). Health is the universal value of humanity. The human body is a single functional unit, in which the activities of individual parts are interconnected and interdependent. Therefore, the perversion of the function of one organ or system is necessarily reflected in the functions of other organs and systems that lead to the development of internal diseases. Internal diseases belong to the section of clinical medicine, the study of which gives us modern ideas about diseases of internal organs, their epidemiology and etiology, pathogenesis, classification, clinical picture, diagnostics and differential diagnosis, prophylaxis and treatment in

accordance with current standards and American, European and domestic protocols for the delivery of health care (1-4). The introductory course in the study of internal diseases is propedeutics, the study of which provides the basis of the knowledge that will be used in the process of detailed study of all diseases. The study of internal diseases is closely related to many basic sciences – general pathology, physiology, biochemistry, microbiology, pharmacology and epidemiology. The knowledge of these subjects is necessary for the enhanced development of medical judgment.

In recent times, medicine has light years away from: new information technologies have started to be applied, it al-

lowing not only to obtain the latest knowledge and exchange of information, but also to efficiently systematize it (5-7). Today, the main task of internal medicine is to recognize the disease and its treatment. Among the constellations of internal diseases, diseases of the cardiovascular system are first in line (8-9). The cardiac pathology is the major cause of death in the population. Each person in his/her life is necessarily faced with cardiovascular disorders. The age-related changes in organs and tissues, metabolism disorders lead to hypertonicity, myocardial hypertrophy, infarctions, blood strokes, cardiac decompensation, arterial sclerosis and reduces life and causes a number of restrictions leading to mortality and disability (10-13).

The endocrine pathology is an equally pressing problem of internal diseases (14). The endocrinologists consider that human health is governed by various hormones produced by the glands of internal secretion (15;16). The state of health and quality of people life depends on carry out a task by the glands of internal secretion. The respiratory diseases also are among the leading in the world in prevalence rate and mortality, and represent a heavy social and financial burden on the country's economy (17;18). In advanced countries, acute and chronic bronchitis, bronchial asthma (BA), pneumonia associated with COVID-19, chronic obstructive pulmonary disease are the most common cause of temporary disability and are amongst the 5 groups of diseases, which is the leading cause of population mortality.

The gastro-intestinal tract diseases have significant economic and social consequences (19). The health of the digestive system depends largely on the lifestyle. In the rhythm of the city human does not have time to eat correctly and to monitor what foods he/she eats. And the pernicious influence of harmful habits affects the digestive system in consequence of which, already at a young age, many people are acquainted with such disease as gastritis. Every person is prone to urinary system diseases. Cystitis is the most commonly among urinary system diseases. The pyelonephritis and urinary disease take a second place. In some cases, the disease may be asymptomatic in a hidden form, and requires detailed diagnosis and treatment (20).

2. OBJECTIVE

Therefore, the aim of the study is to examine the role of internal diseases in the overall incidence of the inhabitants of the Republic of Kazakhstan.

3. MATERIAL AND METHODS

A statistical analysis of medical documentation of medical institutions of the Republic of Kazakhstan was conducted in the period from 2019-2021. The most common diseases of the internal organs, which lead to high rates of mortality and disability, were selected for statistical processing. These diseases included: diseases of the cardiovascular system, diseases of the endocrine system and metabolism disorders, respiratory diseases, diseases of the gastro-intestinal tract and the urinary system. Data on the number of patients with previously diagnosed or newly diagnosed diseases of internal organs are taken from form № 12 "Information about the number of diseases registered in patients living in the medical organization's service area" for 2019-2021.

Through the use of official data of the Republic of Kazakhstan on the population living in this territory in 2019-2021, the main epidemiological characteristics were calculated: prevalence rate (ratio of absolute number of cases to population multiplied by 100 000 persons) and morbidity (ratio of the absolute number of newly diagnosed cases to the population multiplied by 100 000 persons). The size of the population corresponded to the number of people living in the territory of the Republic of Kazakhstan in 2019-2021, of both sexes, of all ages.

The epidemiological indicators were calculated for individual diseases of the internal organs. The pathology of the internal organs was divided into groups of diseases by system, according to the International Statistical Classification of Diseases and Related Health Problems (ICD-10)). In the future, the dynamics of these parameters were evaluated with the help of statistical methods.

The electronic database was created using Microsoft Excel electronic worksheet of the Microsoft Office XP application package (Copyright© Microsoft Corp. 1993-2007). With the help of the functions of this program the material was grouped, samples were formed, summary tables were created. The statistical processing of the study results was carried out using StatSoft STATISTICA 6.1.

The following methods of analysis were used in statistical data processing: 1. Descriptive statistics (statistical estimation of distributional parameters). The mean, median, standard error, standard deviation, asymmetry and excesses coefficients were calculated for quantitative indicators. The absolute and relative risks, standard errors of relative risks and confidence intervals were calculated for qualitative features. Prior to the data analysis, the distribution of the quantitative features was checked against the normal probability law: 1) the construction of the distribution histograms and verification of their conformity with the Gaussian distribution curve, 2) the Shapiro-Wilk test was used (testing the hypothesis that the distribution of the test topic in the general population corresponds to the normal probability law).

The dynamics in morbidity and prevalence of these diseases in general internal pathologies was analyzed with using Absolute Increase (ICR) and Growth Rate (GDP). Linear regression models were used to estimate prevalence and morbidity, the slope angle of the regression line was calculated (k coefficient; the incidence and morbidity dynamics) with the help of Student's t-test the statistical significance of the difference k from zero was assessed: the presence of the dynamics was considered statistically significant at $p < 0.05$.

4. RESULTS AND DISCUSSION

In the process of research were established that diseases of the internal organs play a leading role in the formation of mortality, disability and general morbidity of the inhabitants of the Republic of Kazakhstan. The most common pathology of the internal organs include diseases of the cardiovascular system, diseases of the endocrine system, diseases of the respiratory system, diseases of the organs of the digestive system and diseases of the urinary system. The cardiovascular disease is the largest social and medical problem among all internal diseases; it is the leading cause of mortality in the world. The most common pathologies are considered ischemic heart

disease (disease of blood vessels supplying the heart muscle), diseases of the cerebral vessels (disease of blood vessels supplying the brain) and peripheral arteries (blood vessel disease supplying blood to the hands and feet), rheumatic carditis, arterial hypertension, blood strokes, infarctions, valvular heart diseases and more.

Every year about 1.5 mln cases of cardiovascular diseases are registered in the Republic of Kazakhstan, including more than 100 ths cases that were detected for the first time. The pathology of the cardiovascular system (CVS) is the first among adults in Kazakhstan (51.4 %) and the third among primary morbidity (9.2%). Arterial hypertension (PAH) (39.8%), coronary heart disease (CHD) (31.4%) and cerebrovascular pathology (14.9%) predominate in the disease structure of the cardiovascular system. The prevalence of CVS is 53,3; 39,2 and 14.9 %, respectively.

Analysis of the dynamics of the prevalence of CVS diseases in the population of Kazakhstan showed that during 2019-2021 this indicator increased by 125.4 cases per 10 ths of adults. (from 6980.4 to 7105.8). The dynamic changes in the incidence of CVS are due to the high prevalence of CHD, which increased by 45.5 cases from 2650 to 2695.5 cases per 10 ths of adults. Arterial hypertension (PAH) is one of the most common abnormalities of CVS. In addition, PAH is a risk factor for other diseases of the internal organs. In individuals with high BP, 3-4 times more likely to develop CHD and 6 times more likely to develop brain circulation disorders. Therefore, timely detection of patients with PAH and effective control of blood pressure are important areas of secondary prevention of diseases of CVS, prevention of premature mortality and disability of the population.

As a result of preventive examinations, the organization of health days in the region has led to an increase in the rate of detection of PAH among the population. During 2019-2022 the prevalence of PAH among the adult population of Kazakhstan has been stable at 31.5%, which corresponds to data from special epidemiological studies of the scientific centre. The trend towards a decrease in the prevalence of cerebrovascular pathology (by 3%, from 560 to 546.9 per 10 ths of adults) has been determined. In the same way, it can be explain the tendency to decrease the frequency of strokes and stabilize the frequency of acute myocardial infarctions during 2019-2021.

In order to reduce mortality and disability, patients with cardiovascular diseases are subject to periodic health examination. Only 36.4% of patients with this pathology were overcome by periodic health examination, 62.6 % of whom had PAH, 57.5% had CHD, and 49.4% had cerebrovascular pathology. These indicators show that there are significant disadvantages in the organization of regular medical check-up of patients with CVS pathology and the necessity of outpatient care improvement for these patients. During 2019-2021 we have detected a reducing trend in the number of primary registrations of CVS diseases (from 54.3 to 49.8%), due to inadequate organization of preventive measures in the region. The frequency of patients' visits to outpatient-and-polyclinic institutions is significantly affected by the patient's subjective attitude towards his/her state of health, as well as the level of organization and availability of medical care.

According to anamnestic data, only 34.2% of residents of

Kazakhstan with complaints of cardiac pathology did not seek medical attention. And only 24% of citizens visited outpatient-and-polyclinic institutions after the appearance of the first symptoms of the disease. The combination of the above factors affects the frequency of the population seeks medical attention and, consequently, the extent to which internal diseases are detected. Endocrine pathology is an equally pressing problem of internal diseases. The endocrine system is one of the most important systems in the human body; the normal growth, development and functioning of the body are impossible without its coordinated work. Endocrine organ dysfunction leads to the development of various pathologies. The most common endocrine organ diseases identified in Kazakhstan were diabetes mellitus (39.5%) and thyroid gland (36.2%).

The most rapid increase in the prevalence rate of endocrine diseases was observed during 2019-2021. From thyroid gland pathology, hypothyroidism was detected in 64.2%, thyroiditis – 56.8%, nodular goiter – 47.7% of residents of Kazakhstan. During the study period, there is a tendency to increase the prevalence rate of type II diabetes mellitus, in contrast to the decrease in the detection rate of insulin dependent diabetes mellitus (62.6% against 46.7%). The DM is characterized by a large number of vascular events. Timely detection and high-quality regular medical check-up of patients with DM reduces the risk of developing events of this pathology. The proportion of DM patients with vascular events of various localizations remains high – 38.2% (2019 – 30.6%). The DM is not only a medical problem but also a social problem, because it affects various organs and systems, often resulting in disability. In 2021, the proportion of diseases of the endocrine system in the structure of primary disability of the adult population of Kazakhstan was 5.6%, of which 78.2% was attributable to the DM as a cause of permanent disability. The reducing trend in the frequency of primary registration of DM (from 67% to 45.5%) is a cause for concern. The type II diabetes mellitus represents 94.5% of all first diagnosed cases of DM in Kazakhstan. There was a delay in the detection of DM – one in five (20.7%) of the first cases of DM is diagnosed at a stage of the disease where sequelae have already developed.

Due to unhealthy lifestyle in 37% of residents of Kazakhstan, metabolic syndrome (MS) was detected. The prevalence rate of this syndrome is 18% in people over 30, 34% over 30 and 44% over 50. Obesity is the leading risk factor for MS development. According to our results, the prevalence rate of obesity among the population of Kazakhstan was 34%, among men 20.2 % and among women 43.5%. The second most common risk factor was metabolic imbalance, 58.3% (hypercholesterolemia and hypertriglyceridemia). The presence in patients MS arterial hypertension closes the triple – 50%. Therefore, our research has shown that one of the main risk factors for the development of MS is overweight.

Among the constellation of internal diseases, diseases of the respiratory system occupy a leading place in the structure of general morbidity, to which WHO constantly draws attention. According to WHO, approximately 600 mln people worldwide suffer from respiratory diseases. In Kazakhstan, the prevalence rate of chronic obstructive pulmonary disease amount to 14.2% among smokers, 3.3% are non-smokers, and

6.9% are people who have not smoked before. It is known that 4-6% of men and 1-2% of women suffer. The pulmonary disease is the fifth leading cause of mortality, it is being noted the increase of this disease.

The most common respiratory diseases in Kazakhstan are bronchitis (71.8%), tracheitis (54.1%), bronchial asthma (47.4%), pneumonia (44.1%). Acute bronchitis (58.2%) is prevalent in the structure of bronchitis diseases, as opposed to chronic bronchitis – 32.8% of cases. Bronchial asthma is one of the most common chronic bronchopulmonary nosology, which is often found in conditions of the primary medical assistance delivery. It is the local practitioner are the first to whom patients seek medical attention with a certain range of respiratory symptoms and who can suspect and diagnose chronic diseases such as BA, chronic obstructive pulmonary disease (COPD), pneumonia. The overall incidence of chronic obstructive pulmonary disease (COPD) among the adult population of the Republic of Kazakhstan is 56%, except but a growth rate of 17.9% over three years (2019-2022). COPD is the only therapeutic disease mortality from which has not decreased, despite preventive and curative measures. There was a significant increase in the incidence of pneumonia against the background of the COVID-19 pandemic in 2020-2021 – 3.5 times compared to 2019 (1676.15 per 100 ths of the population), including the viral pneumonia - 65 times (783.08 per 100 ths of the population). Pneumonia accounted for 41,7% in the structure of mortality from respiratory diseases in the Republic of Kazakhstan in 2019-2021; mortality was 21.5 per 100 ths of the population. COVID-19 is also reason of the high mortality rate. Early detection of respiratory system pathologies is the prevention of the development of serious complications such as oncology.

According to the forecasts of experts of the World Health Organization, diseases of the digestive organs will occupy one of the leading places in the structure of morbidity of the population on a par with cardiovascular pathology in XXI century (7). Symptoms of gastro-intestinal tract diseases are very common and have significant economic and social consequences. It is estimated that 10.5% of the population in Kazakhstan suffer from gastro-intestinal tract diseases, with prevalence rate reaching 34% among persons aged 65 and older. At the same time, there is a grading of sexual differences in the frequency of gallstone disease, gastric ulcers and duodenal ulcers; there is a widening of the age boundaries of the formation of pathology of the digestive organs; there is a clear trend towards an increase in the incidence of pathology of the upper gastrointestinal. Kazakhstan has a high mortality rate from this pathology (7.6 %), which is predominant in both the EU and CIS countries; in particular, mortality from hepatic diseases related to alcohol abuse is 5 times higher than in the EU (19).

Symptoms of gastro-intestinal tract diseases are very diverse and depend on affected organ. Common symptoms associated with digestive system pathologies include: abdominal pain of varying intensity and localization, absence of appetite, regurgitation and epigastric burning, sicchasia and vomiting, weight loss, bowel disorders, general weakness, gaseous distention. The main causes that provoke the development of pathologies of the gastro-intestinal tract: overweight, smoking, alcohol abuse, unhealthy diet and diet violation,

stress, diabetes mellitus, excessive use of effervescent beverages and coffee, low physical activity, infectious affect of the body.

The prevalence rate of diseases of the gastro-intestinal tract increased in 2 years by 3 % – from 2856.8 to 2913.7 cases per 10 ths of the adult population of Kazakhstan. In this class of diseases, cholecystitis and cholangitis (28.6%), pancreas gland disease (17.2%), stomach and duodenal ulcer (7.5%) accounted for the largest proportion. The fastest rate during 2019-2021 the prevalence rate of pancreatic diseases has increased (by 14.9% – from 459.8 to 533 per 10 ths of adults). Only half of the patients with gastrointestinal pathology (52.1 per cent) were found under regular medical check-up in 2019-2021, including 85.5% with stomach ulcers and duodenal ulcers, 48% with cholecystitis, 74.9% with hepatic cirrhosis, 70.2% with chronic hepatitis, 51% with pancreas gland pathology. Intestinal canal pathology in the form of irritable bowel syndrome was found in 40.5% of residents of Kazakhstan.

For the period 2019-2021. There is a reducing trend in the frequency of primary detection of almost all the clinical entity that form this class of diseases, with the exception of pancreas gland pathologies, the incidence of which has remained almost unchanged. The final pathology of the internal organs are diseases of the urinary system. The increase in the level of this pathology occurs under conditions of reduced quality of life and ecological disadvantage of the studied region. Among the most common diseases of the urinary system are urinary tract infections (UTI). UTI is a collective term that combines all infectious and inflammatory diseases of the organs of the urinary system (cystitis, pyelonephritis, urethritis).

The prevalence rate of cystitis in the Republic of Kazakhstan is 498 cases per 100 ths of the population. Statistics show that one in two women has experienced this problem at least once in her life. The incidence of cystitis in adult men is very low - 6-7 episodes per year for 10 ths of men aged 25-55 years. Among the infectious kidney damage, there is pyelonephritis. The prevalence rate of which is 390-450 cases per 100 ths of the population. In 73% of cases, pyelonephritis develops before the age of 40, and women are 2-5 times more likely to have the disease than men. The incidence of the disease is gradually equalizing between men and women at age 60.

The development of urinary stone disease is possibly against the background of general disorders in the human body. The leading triad of clinical symptoms of this disease is lumbar pain (72%), urination abnormalities (67.9%) and renal colic - an attack of violent and severe lumbar pain. Hypercalciuria (an excessive amount of calcium in urine caused by osteoporosis – removal of calcium from the bones), chronic infectious and inflammatory processes in the urinary tract, urodynamics disorders (urine stagnation in the urinary bladder) and inadequate fluid intake lead to urolithiasis (another term urinary stone disease). The incidence of urinary diseases has increased almost 1,5 times over the past two years. Only 34% of patients with the urinary system pathology were exposed to regular medical check-up in 2018-2021. This shows that there are significant disadvantages in the organization of regular medical check-up of patients with diseases of the urinary system.

5. CONCLUSION

As a result of the study, it was established that there are quite common diseases of the internal organs in the Republic of Kazakhstan. Cardiovascular disease occupies a leading position (51.4%) among them, the most pressing problem is arterial hypertension (39.8%) and coronary heart disease (31.4%). The common endocrine organ diseases were diabetes mellitus (39.5%) and thyroid gland pathology (36.2%). From thyroid gland pathology of residents of Kazakhstan was detected Hypothyroidism in 64.2%, thyroiditis – 56.8%, nodular goiter – 47.7%. During the study period, there is a tendency to increase the prevalence rate of DM2, in contrast to the decrease in the detection rate of IDDM (62.6% against 46.7%).

Among respiratory diseases, bronchitis was 71.8% of patients, tracheitis – 54.1%, bronchial asthma – 47.4%, pneumonia – 44.1%. Against the background of the COVID-19 pandemic in 2020-2021, it was noted a significant increase in the incidence of viral pneumonia – 3.5 times compared to 2019. The level of the incidence of diseases of the gastro-intestinal tract increased in 2 years by 3% – from 2856.8 to 2913.7 cases per 10 ths of adults in Kazakhstan. The highest rate of increase was found in the incidence of pancreas gland diseases (14.9% – from 459.8 to 533 per 10 ths of adults). The urinary system diseases are a less common pathology of the internal organs. The prevalence rate of cystitis is 498 cases per 100 ths of the population, pyelonephritis - 390-450 cases per 100 ths of the population.

During the same period, the levels of primary morbidity among the adult population of the Republic of Kazakhstan decreased in all these classes of diseases. This trend shows the necessity of improvement of the regular medical check-up organization and upgrading its accessibility and quality to ensure the full and timely detection of diseases of the internal organs as an important component of their secondary prevention. Therefore, the pathology of the internal organs, which includes various diseases, has a high prevalence rate, leading to mortality and disability of the population of the Republic of Kazakhstan.

- **Declaration of patient consent:** The authors certify that they have obtained all appropriate patient consent forms.
- **Author's contribution:** IS contributed to the conceptualization, methodology, and formulation of the research questions. AO played a role in the design of the study, data collection, and analysis. NN contributed to the interpretation of the data and provided critical input during the writing of the manuscript. KK contributed to the analysis and interpretation of the epidemiological data. GI contributed to the literature review, data analysis, and manuscript writing. All authors reviewed and approved the final version of the manuscript.
- **Financial support and sponsorship:** No funding was received for conducting this study.
- **Conflicts of interest:** There are no conflicts of interest.

REFERENCES

1. Ryabova, S.I. 2006. Internal illnesses. St. Petersburg: Piter.
2. Yemelyanova, E.A., Kozhevnikov, A.A., Koval, N.V., Dordina, S.G. (2007). Internal illnesses. Yakutsk: Media-kholding Yakutiya.
3. Zabolotnykh, I.I. 2007. Clinical and expert diagnostics of pathology of internal organs: A guide for physicians. Moscow: SpetsLit.
4. Golofeevskogo, V.Yu. 2006. Classification of diseases of internal organs and methods of therapeutic research. St. Petersburg: Foliant.
5. WHO Mortality Database. 2019. <https://www.who.int/data/data-collection-tools/who-mortality-database>
6. Roytberg, G.Ye. 2007. Internal illnesses. Digestive system. Moscow: Medpress-inform.
7. Coronavirus Disease (COVID-19): Weekly Epidemiological Update. 2022. <https://reliefweb.int/report/world/coronavirus-disease-covid-19-weekly-epidemiological-update-12-april-2022>.
8. Mehra, M.R., Desai, S.S., Kuy, S., Henry, T.D., Patel, A.N. 2020. Cardiovascular disease, drug therapy, and mortality in Covid-19. *New England Journal of Medicine*, 382(25), e102.
9. Shlyakhto, E.V. 2020. Cardiology. National leadership. Moscow: GEOTAR Media.
10. Saygıtov, R.T. 2015. Cardiovascular diseases in the context of socio-economic priorities of Russia's long-term development. *Vestnik Rossiyskoy Akademii Meditsinskikh Nauk*, 70(3), 286–299.
11. Chistiakov, D.A., Melnichenko, A.A., Orekhov, A.N., Bobryshev, Y.V. 2017. Paraoxonase and atherosclerosis-related cardiovascular diseases. *Biochimie*, 1(2), 19–27.
12. Sacks, F.M., Lichtenstein, A.H., Wu, J.H.Y., Appel, L.J., Creager, M.A., Kris-Etherton, P.M., Miller, M., Rimm, E.B., Rudel, L.L., Robinson, J.G. 2017. Dietary Fats and Cardiovascular Disease: A Presidential Advisory From the American Heart Association. *Circulation*, 136(3), e1–e23.
13. Kadykov, A. S. 2018. Chronic vascular diseases of the brain. Moscow: GEOTAR Media.
14. Troshina, Ye. A., Platonova, N. M., Panfilova, Ye. A. 2018. The analytical review of monitoring of the basic epidemiological characteristics of iodine deficiency disorders among the population of the Russian Federation for the period 2009—2015. *Problems of Endokrinologii*, 64(1), 21–37.
15. Gerasimov, G. A. 2015. Sad statistics. *Clinical and Experimental Thyroidology*, 4(11), 6–12.
16. MacLeod, M., Papi, A., Contoli, M., Beghé, B., Celli, B.R., Wedzicha, J.A., Fabbri, L.M. 2021. Chronic obstructive pulmonary disease exacerbation fundamentals: Diagnosis, treatment, prevention and disease impact. *Respirology*, 26(6), 532–551.
17. Zhou, P., Yang, X.L., Wang, X.G. 2020. A pneumonia outbreak associated with a new coronavirus of probable bat origin. *Nature*, 579, 270–273.
18. Guan, W.J., Ni, Z.Y., Hu, Y. 2020. China medical treatment expert group for Covid-19. Clinical Characteristics of Coronavirus Disease 2019 in China. *New England Journal of Medicine*, 382, 1708–1720.
19. Kalinina, A.V., Khazanova, A.I. 2007. Gastroenterology and Hepatology: Diagnosis and Treatment: A Guide for Physicians. Moscow: Nauka.
20. Bobkova, I.N., Vatazin, A.V., Smirnov, A.V. 2019. Chronic kidney disease. Moscow: Nauka