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STRUCTURAL CHARACTERISTIC OF THE MODEL OF EARLY DETECTION AND PRIMARY PREVENTION OF CEREBRIAL STROKE AMONG THE ADULT POPULATION

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In the article, based on the analysis of world literary sources, official statistical data, and the work of international medical organizations, a systematic analysis and generalization of modern world experience regarding the possibilities of improving the system of early detection and primary prevention of brain strokes among the adult population was carried out. Based on this, an optimized model of early detection and primary prevention of brain strokes among the adult population was developed and scientifically substantiated. The optimized model takes into account the existing medical and social problems of people with brain strokes, the existing shortcomings in the measures of early detection and primary prevention of brain strokes among the adult population, and global achievements and developments. The proposed optimized model of early detection and primary prevention of brain strokes was developed on the basis of own research, careful and thorough study and analysis of modern models of work of domestic health care institutions and best practices of other countries. The optimized model consists of six main interconnected and interdependent main activity apparatuses (structural components of the model): conceptual and categorical apparatus (purpose, tasks, principles, priorities, approaches, properties); strategic and operational apparatus (management levels: strategic, tactical, operational); rule-making apparatus (existing legal framework, formation of new rule-making acts); information and communication apparatus (collection and processing of information, formation of a data bank); functional and organizational apparatus (individual, family, group and population level); practical-implementation apparatus (resource-action and subject-object guidelines, achievement of expected results, verification of effective and corrective measures (if necessary)).

Keywords: *measures of early detection and primary prevention, stroke pathology, optimized model, functional devices.*

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Introduction

World Health Organization (WHO) specialists determine the significant relevance of research into various aspects of cardiovascular disease (CVD). This is due to the significant negative consequences that provoke CVD in the form of high levels of prevalence and significant disability and mortality of the world population due to this nosology. According to existing studies, CVDs cause more than 18 million global deaths every year [1]. The structure of mortality due to CVD primarily includes diseases of the circulatory system: coronary heart disease and brain strokes (BS) (in 2016, 15.2 million premature deaths [2]). These data are confirmed by other studies, which determine the annual global mortality due to BS at the level of 6.7 million (11.9% of the total number of global deaths) [3; 4].

This determines the relevance of the study of cerebrovascular diseases (which include BS) among all CVDs due to the high global levels of their prevalence (with a tendency to constant growth) and mortality and disability of the world population [5–9].

According to the opinion of WHO specialists, after ischemic heart disease, BS ranks second in terms of prevalence and causes of disability and mortality [10]. Global levels of prevalence of BS in different regions of the world community have significant differences and determine a total of up to 30 million new cases each year: European countries – more than 1.2 million, in economically developed countries (European Union (EU), Switzerland, Norway, Iceland) – more 1.1 million, in the United States of America – more than 550 thousand [11–13]. Among all new cases of BS, more than 40.0% end fatally in the first month; 50.0% – for the first year; after the disease, 20.0–40.0% of people become completely dependent on external assistance, and only 10.0% achieve full recovery of their functional and social status.

According to forecasts of WHO experts, the prevalence of BS will increase due to high levels of risk factors (aging population, CVD, hypertension, diabetes, hyperlipidemia and hypercholesterolemia [14], reduced physical activity, nutritional disorders, alcohol abuse, tobacco smoking, stress, etc.) and by 2035 will increase by 34.0% among EU countries [4].

Ukraine also has significant levels of prevalence of diseases of the circulatory system, cerebrovascular diseases and directly BS and, according to the definition of the WHO, has high negative trends [15]. Up to 150,000 new cases of MI and 40,000–45,000 deaths due to BS are recorded in Ukraine every year. Mortality in Ukraine due to BS is 30.0–40.0% in the first month and up to 50.0% in the first year after BS.

Therefore, determining the possibilities of reducing the significant levels of prevalence of BS and the negative medical and social consequences provoked by them in the form of mortality and disability of the population is a very urgent problem of world medicine.

The aim of the study – to develop and scientifically substantiate the structural component models of early detection (ER) and primary prevention (PP) of BS among the adult population.

Materials and Methods

According to the existing data of world literary sources, official statistical data and developments of international medical organizations, a systematic analysis and generalization of modern world experience regarding the possibilities of improving the system of ER and PP of BS among the adult population was carried out.

The ethical approval was obtained from Bioethics Committee of the Kharkiv

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National Medical University. All patients provided written consent to participate in research in accordance with the recommendations of the Ethics Committees for Biomedical Research, Ukrainian Health Legislation and the Declaration of Helsinki (2000).

Results and Discussion

ER and PP of BS among the adult population takes into account the complexity and multi-level of their provision, which implies the involvement in these processes of medical workers of various professional directions and specialists of other fields of activity. Among these specialists, representatives of the mass media, social networks, institutions providing secondary and higher medical education and general secondary education, the management field, public and volunteer organizations, specialists in sanitary and educational activities, etc. are primarily identified. ER and PP of BS takes into account the need to provide medical and social measures at all possible levels of influence (individual, family, group, population). The main goal of ER and PP of BS is to reduce the prevalence of BS, indicators of disability and mortality due to this pathology among the adult population of Ukraine.

In our opinion, the maximum effectiveness of achieving these goals becomes possible only under the condition of implementation of the mechanisms of ER and PP of BS, taking into account the complexity and multilevel, as the individual efforts of representatives of different industries and levels are quite ineffective. This is determined by the need for specialists in various fields of activity to solve urgent issues that go beyond their professional competence. Achieving the main goals of the system of ER and PP of BS is possible only if these measures are implemented at the stage of the initial impact of risk factors (RF) of the occurrence of BS.

Light evidence indicates the significance of the adaptive mechanisms of ER and PP of BS at various levels of their implementation, which is confirmed by international medical and non-medical organizations (WHO, United Nations, American College of Cardiology, American Heart Association, American Academy of Physician Assistants, Association of Black Cardiologists, American College of Preventive Medicine etc.). National socio-political, social, economic and other features of the functioning of our state (especially in view of the russian aggression) call for the need to adapt the technologies for implementing of ER and PP of BS to the National conditions and their optimization with the adjustment of already existing mechanisms.

National conditions for the functioning of the health care sector are characterized by insufficient material and technical support of the Ministry of Health institutions, insignificant effectiveness of state policy in the direction of the implementation of healthy lifestyle measures; low readiness of medical and other personnel to perform their functional duties in new economic conditions and other organizational and functional obstacles that occur due to significant changes in the main spheres of activity of our state due to rapid and reform processes.

Many outstanding domestic organizers of health care (Liashko V.K., Stepanov M.V., Ognev V.A., Liekhan V.M., Voronenko Yu.V., Hruzieva T.S., Slabkyi H.O., Lashkul Z.V., Detsyk O.Z., Parii V.D., etc.) define the preventive direction of modern medicine and public health as a priority. This provides the greatest economic expediency and low cost and the possibility of achieving a high level of medical, social and economic efficiency [16–18] and makes it possible to achieve a significant improvement in the health

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indicators of the population and increase their quality of life; reduction of morbidity, mortality and disability levels, etc. [19].

The experts of the Ministry of Health of Ukraine also note the economic expediency of the preventive focus of medicine [20]. Preventive orientation is primarily ensured by the implementation of measures of ER and PP in the structure of the Ministry of Health. Specialists indicate that ER and PP can be based on both a population approach (to prevent the disease in the community) and an individual approach (aimed at preventing the primary occurrence of the disease in each individual, practically healthy person) levels. According to the experts of the Ministry of Health, the measures of ER and PP of BS can be effectively implemented in the conditions of the primary medical care by reducing the risk of CVD, stroke or vascular cognitive disorders. ER and PP can also be implemented at the population level, subject to the implementation of legislative and regulatory measures, as well as increasing the population's awareness of possible RF of BS.

RF of BS development are divided into non-modifiable (unchangeable individual characteristics characteristic of a specific person), modifiable (can be controlled or eliminated with the help of healthy lifestyle measures or targeted medical interventions) and potentially modified (conditionally can be controlled or eliminated). Age, sex, race (ethnicity), family history of stroke, and genetic factors are unmodified RF for BS. Modified RF are hypertension, atrial fibrillation, diabetes, obesity, hypercholesterolemia, tobacco smoking, asymptomatic carotid artery stenosis, valvar heart defects, sickle cell anemia, postmenopausal hormone therapy, improper diet, lack of active and adequate physical activity, etc. Potentially modified RF are metabolic syndrome, alcohol and drug abuse, use of oral contraceptives, sleep-disordered breathing, migraine, hyperhomocysteinemia, increased level of lipoprotein (a), increased level of lipoprotein-associated phospholipase, hyper coagulation, inflammation and infection, etc. [21–23]. Prevention of RF for BS are the main strategies for preventing the first stroke, which are classified as PP measures [24–27].

The increased risk of BS development is contributed by numerical individual and population RF, which may support causal-hereditary relationships with BS development. Most of these RF are amenable to adjustment of appropriate medications and changes in the way of life and encouragement of healthy lifestyle approaches (active and adequate physical exercise, sleep and eating habits, adequate mental and physical overloads, regulation of salt mixing, blood pressure control, etc.). Most RF of BS development have an independent effect, but there are interactions between them, which should be taken into account during the development and implementation of ER and PP measures of BS and the selection of an appropriate strategy for the implementation of an individual PP program.

According to the definitions of many researchers, the effectiveness of ER and PP of BS among the adult population remains at an inadequate level even today, and the population's needs for these measures are constantly growing due to the constant increase in the prevalence of this pathology. According to the analysis, there are a number of medical and social problems among the adult population with BS today, the solution of which is urgently needed through the implementation of an optimized model of ER and PP of BS among the adult population at both the state and other levels.

Taking this into account and identifying the main shortcomings in measures of ER and PP of BS among the adult population and analyzing the main provisions of the existing regulatory documents, we

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developed and scientifically substantiated an optimized model of ER and PP of BS among the adult population. This model takes into account all identified shortcomings and global achievements and developments.

The proposed optimized model of ER and PP of BS was developed on the basis of own research, thorough processsing and analysis of modern models of work of domestic health care institutions and best practices of other countries. The optimized model (*Fig.*) consists of six main interconnected and interdependent main activity devices (structural components of the model):

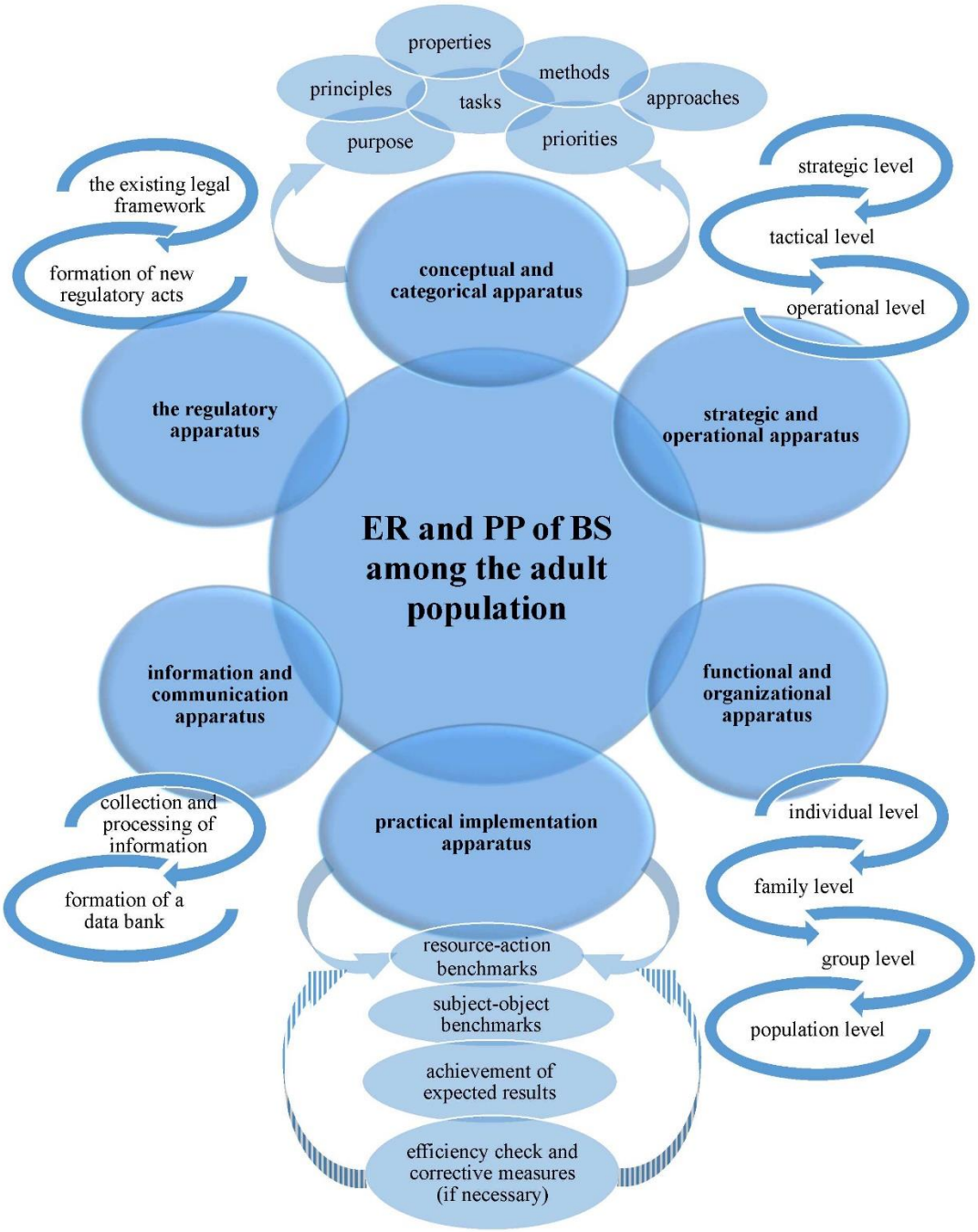

Fig. Optimized model ER and PP of BS.

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- conceptual and categorical apparatus (purpose, tasks, principles, methods, priorities, approaches, properties);

- strategic and operational apparatus (management levels: strategic, tactical, operational);

- the regulatory apparatus (the existing legal framework, formation of new regulatory acts);

- information and communication apparatus (collection and processing of information, formation of a data bank);

- functional and organizational apparatus (individual, family, group and population level);

- practical implementation apparatus (resource-action and subject-object benchmarks, achievement of expected results, efficiency check and corrective measures (if necessary)).

Conclusions

Thus, based on the analysis of world literature sources, official statistical data, and the work of international medical organizations, a systematic analysis and generalization of modern world experience regarding the possibilities of improving the system of ER and PP of BS among the adult population was. Based on this, an optimized model of ER and PP of BS among the adult population was developed and scientifically substantiated. The optimized model takes into account the existing medical and social problems of persons with BS, the existing shortcomings in measures of ER and PP of BS among the adult population, and global achievements and developments. The optimized model consists of six main interconnected and interdependent main activity apparatuses (structural components of the model): conceptual-categorical, strategic-active, normative, informational-communicative, functional-organizational and practical-implementation.

Conflict of interest is absent.

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СТРУКТУРНА ХАРАКТЕРИСТИКА МОДЕЛІ РАННЬОГО ВИЯВЛЕННЯ ТА ПЕРВИННОЇ ПРОФІЛАКТИКИ МОЗКОВИХ ІНСУЛЬТІВ СЕРЕД ДОРОСЛОГО НАСЕЛЕННЯ

В статті за проведеним аналізом світових літературних джерел, офіційних статистичних даних та напрацювань міжнародних медичних організацій було проведено системний аналіз та узагальнення сучасного світового досвіду щодо можливостей удосконалення системи раннього виявлення та первинної профілактики мозкових інсультів серед дорослого населення. На основі цього було розроблено і науково обґрунтовано оптимізовану модель раннього виявлення та первинної профілактики мозкових інсультів серед дорослого населення. Оптимізована модель враховує існуючі медико-соціальні проблеми осіб із мозковими інсультами, існуючі недоліки в заходах раннього виявлення та первинної профілактики мозкових інсультів серед дорослого населення та світові досягнення і напрацювання. Запропонована оптимізована модель раннього виявлення та первинної профілактики мозкових інсультів розроблена на основі власних досліджень, ретельного та досконального опрацювання і аналізу сучасних моделей роботи вітчизняних закладів охорони здоров'я та передового досвіду інших держав. Оптимізована модель складається з шести основних взаємопов'язаних і взаємозалежних основних діяльнісних апаратів (структурних складових моделі): понятійно-категоріальний; стратегічно-діяльнісний; нормотворчий; інформаційно-комунікативний; функціонально-організаційний; практично-реалізаційний).

Ключові слова: *заходи раннього виявлення та первинної профілактики, інсультна патологія, оптимізована модель, діяльнісні апарати.*

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