

Central Nervous System diseases in Pavlodar region

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I. INTRODUCTION

Nowadays people are more and more suffering from neurological disorders. Neurological disorders are one of the causes of increasing mortality worldwide and account for 12% of total mortality. Diseases such as Parkinson's, Alzheimer's, Dementia is the most common neurological diseases which affect millions of inhabitants of the planet. For instance, 47 millions of people are suffering from Dementia and the number of sufferers is still growing. According to information on Alzheimer's Diseases International that 35.6 million people are sick of the AD in 2010, and based on their sources of 2050, this number will grow and reach to 115.4 million people. Moreover, the Government tries to solve this problem by supporting financial help. Based on information on the National Institute of health, the NINDS funded approximately \$107 million to discover ways of improving treatments out of a total of \$161 million. As we can see problems connected with the Neurological disorders are topical in nowadays and have global importance. The Global Burden of Disease (GBD) studied, a collaborative endeavour of the World Health Organization (WHO), the World Bank and the Harvard School of Public Health, drew the attention on the international health community to the burden of neurological disorders and many others chronic conditions. Also, this problem is not only a global issue, but it is also National trouble. Based on information Kazakhstan Association of Neurologists and Neuroscience that all neurological diseases have medical and social importance, i.e., more than 50% of disabled people of our country have become established as a result of neurological diseases.

This project targeted for detection main reasons with CNS disorders actually in Pavlodar region and describes them more precisely. Obviously, citizens should understand ways of preventing such diseases. Due to the fact that in Pavlodar the number suffering from diseases of the nervous system increases, it raises the question about treatment. As a rule, the treatment of these diseases costs a lot of money. Moreover, this project aims to examine the conditions for the treatment of diseases in Pavlodar. Actually, I have chosen such kind of topic because is relative to the future profession. In future, I want to become a neurosurgeon. This project work is like the introduction part of neurology and some diseases that I will be familiar, and my knowledge will help me to investigate and treat them.

Reasons for CNS diseases: Causes of Alzheimer's, Parkinson's, Dementia diseases have a lot of similarities. From the fact that the cells of our brain begin to die and lost the connection between neurons. In general, one of the main similarities in these diseases is that certain parts of the brain suffered and do not work correctly. In 2013 because of Alzheimer's disease, 1402.7 men per 100000 men and 1066.2 women per 100000 women died. Based on the Institute for Health Metrics and Evaluation, Alzheimer's disease and all types of Dementia are ranked 9th. Mortality due to illness increased by 15.2% between 2005 and 2016. Moreover, such things as alcohol, poor diet, smoking and insufficient attention to health can also affect the appearance and further development of the disease. The main reason for Alzheimer's disorder is atrophy of particular parts of the brain which responsible for critical thinking and memory. According to information from the National Health Service of the United Kingdom, some factors such as age, family history, Down's syndrome, cardiovascular disease are increasing the risk of appearance Alzheimer's disease.

Obviously, high age will negatively affect the living of brain cells and other factors are increasing the likelihood of developing Alzheimer's disorder. Dementia is caused by a threat to brain cells. The intervention of damage leads to the disability of brain cells to interact with each other normally. Consequently, feelings, behaviour and thinking ability are can be violated. Every part of our brain responds to some functions. For instance, occipital lobe of the cerebrum regulates vision and reading ability, a temporal lobe of the cerebrum is responding for memory and hearing. Obviously, if disorder will develop in these areas eventually the functions of the brain will be violated. More causes are permanent and can be developed in all period of life. Moreover, based on information from Alzheimer's Association, some factors such as "depression, harmful medicals, abusing with alcohol, thyroid problems, vitamin deficiencies" can lead to deterioration of disorder. In the human brain, there are a number of proteins that can negatively or positively affect the work of the brain. But if a cluster of harmful proteins gathers

in the middle brain, it can lead to Parkinson's disease. It is the accumulation of plaques, neurofibrils and proteins that is the main cause of Parkinson's disease.

II. The ways of preventing or stopping CNS diseases

Actually, nowadays medicine doesn't have appropriate ways of treating such diseases as Dementia, Alzheimer's, and Parkinson's. Although, research is underway to find new ways to treat and prevent the disease. According to the Alzheimer's Association, the main and the most effective way of prevention is using antibodies which can stop the ongoing development of beta-amyloids. Actually, beta amyloids are lead to Alzheimer's diseases and antibodies can prevent or suspend disorder. In addition, before the development of symptoms, the beta-amyloid plaques are monitored by different brain scans such as MRI and CT. Based on information of Columbia University Department of Neurology the offset of dopamine in the brain is a way of stopping disorder. Most drugs can help to control symptoms quite well. Ageing is the main factor which affects the emergence of Dementia disease, but there are a lot of ways of reducing Dementia.

- Every day, 30 minutes of exercise. This will contribute to the improvement of cardiac and mental work of the body. Do certain specific exercises you can prevent the symptoms of the disease.
- Lead a healthy lifestyle. Give up alcohol, Smoking and poor nutrition. Because it's gonna affect the way your brain works. Nicotine and alcohol kill nerve cells and contributes to the appearance of plaques in the brain.
- Try more often to read and do mental strain. It will make your brain work. Solve crosswords, read books and learn something new. All these actions will help to save memory and attention.

In principle, all factors of prevention Dementia disease can reduce the symptoms in different degrees.

General treating methods and improving them in the Pavlodar region : These diseases in a complicated form can not be cured completely, but with early symptoms, you can use medicines to cure the disease or stop for a while. According to information from Scottish Intercollegiate Guidelines Network, early stages of Parkinson's disease is treated with drugs. For example as LEVODOPA, ELLDOPA, PDRG-UK. With the help of the right combination of these funds, the chance to cure the disease increases to 40 %. Although, it will take 4-6 years of treatment. Dopamine is also a method of treating the disease. Dopamine stops the spread of the disease and improves the cognitive function of the brain and motor functions. Based on information from the National Institute on Aging, some drugs like donepezil, galantamine, memantine, navistignine are can treat all stages or can prevent disorder. Moreover, The disease kills nerve endings like synapse and neurotransmitters. These drugs work as neurotransmitters they bind nerve endings together and prevent memory loss or other symptoms of the disease. In addition, the methods of treatment are still developing. According to information from scientific magazine ScienceDaily, Australian researchers have discovered the role of a key protein in the development of Alzheimer's disease. Scientists have found that in the course of Alzheimer's disease in the brain, we lose protein kinase 38. Dementia and Alzheimer's disease are similar, respectively methods treatment also similar. According to information Alzheimer's Research UK, some drugs like donepezil, rivastigmine, galantamine can treat the disorder.

Actually, symptoms of diseases such as Dementia, Alzheimer's, Parkinson's are treated in the Almaty region only. We have only one hospital for treating, it is "Center for the treatment of neurosis and Alzheimer's disease", which located in Almaty city. However, in Pavlodar, there are hospitals where many operations are treated and carried out, but diseases of the Central nervous system are not treated. Moreover, we have local neurosurgeons and hospitals to which you want the equipment for treatment. In our hospitals, it is also possible to treat these diseases with drugs without leaving the city or country for the sake of treatment.

III. AIM

The aim of my project is to investigate the main causes and ways of treatment and prevent these disorders in our population. For achieving my main aim I had chosen research questions.

Research questions:

- Why in Kazakhstan more and more people suffer from diseases of CNS?
- How to stop or prevent diseases associated with the CNS?
- How to develop ways for treating the problems in Pavlodar?

Actually, every year the likelihood of suffering from diseases are still growing and my duty is to explain to them how to prevent symptoms of troubles. I had chosen these research questions for understanding the prevalence of disorders in Kazakhstan and ultimately submit the ways of treating them in Kazakhstan.

IV. METHODS

In this project, I had used two main types of sources such as primary and secondary. Actually, for primary sources, I used interviews of specialists and for secondary sources, I used any scientific reports, articles and information from official sites of health organizations and universities. My first method is an observation of secondary sources. I had chosen special secondary sources for observation of my topic. For instance, I used information from health organizations, international associations, and services like the World Health Organization, Kazakhstan Association of Neurologists and Neuroscience, Alzheimer's Association, and National Health Service of United Kingdom. Moreover, some information from official sites of institutes and universities are used as a source. In particular, information from the University of New South Wales, Columbia University and institutes such as the National Institute on Aging and National Institute of Neurological Disorders and stroke. I had chosen only these types of sources for the reason that credibility of the information. Moreover, they not just related to my topic, some articles of the labour or work was written by eminent doctors and the best healthcare organizations. From these sources, I used information such as main causes, symptoms, statistics, and ways of prevention related to diseases.

My second method was qualitative and like an instrument I employed interview. The qualitative method helps to seek answers to questions and to collect valid evidence. Furthermore, this method helps me to avoid generalisation. Obviously, before taking an interview I saved the confidentiality of respondents' with signing an Interview Consent Form. For the interview, I had chosen 5 representatives of different specializations. For instance, I surveyed 2 neurosurgeons, 2 teachers of biology, and sonographers or Uzist (people who work with MRI). Of course, each of these people is a specialist and had some knowledge related to CNS diseases and in general to neurology. As an example, neurosurgeons which made the operation to patients gave more reliable information and avoid bias about the causes and ways of prevention disorders. Actually, they more briefed about the current situation in Kazakhstan and how our authority controls the frequency of mortality because of CNS diseases. For every individual, I spend about 15-25 minutes because this time was more than enough for getting needful information.

V. RESULTS

In this part of a research paper, I will analyze and interpret data of 5 one-on-one interviews with the use of relevant literature. I collected data from individuals who work in different specializations. For further investigation, I manage to use their information for analyses and making some conclusions of my research questions. Actually, I had chosen 3 research questions for investigation. My first research question is <Why in Kazakhstan more and more people suffer from diseases of CNS?>. In this case, my respondents replied about reasons or factors that can lead to disorders. According to a neurosurgeon, the main reason for diseases is "One way or another, as a result of the causative factor, the processes of protein metabolism in the brain tissue change. Between neurons plaques such as pathological proteins, β -amyloid disrupts communication between cells and has a toxic effect on the brain. With no connection to other cells, neurons begin to die." Actually, the neurosurgeon said some reasons for the formation of Parkinson's disease. In the example of the proof, some dangerous proteins accumulate in one part of the brain and cause the formation of plaques, neurofibrils, and proteins. Additionally, the other participant (Biology teacher 1) said: "In principle, the occurrence of diseases such as Alzheimer's Parkinson's are associated with the fact that nerve cells die, that is, it is neurons that secrete neurotransmitters, dopamine due to this, all our nerve cells die and these diseases appear". I guess that two answers of respondents reflect the main and secondary causes of disorders.

However, the main reasons appearance of disorders are atrophy of particular parts of the brain, which responsible for critical thinking and memory, a threat to brain cells and the intervention of damage leads to the disability of brain cells to interact with each other normally. In comparison with data from Alzheimer's Association which mentioned some different substantiation about the reasons for diseases, I could get more indeed answers from respondents. In addition, this question is relating to factors that can prone to the formation or worsening symptoms. According to a neurosurgeon, the main idea is the reason of growing people who suffer from Parkinson, Dementia, and Alzheimer's because of "untimely visit to the therapist, do not pay attention to blood pressure can lead to choking or illness. Stress, poor nutrition, insufficient saturation of the body with vitamins, insufficient sleep, stress, alcohol can negatively affect the further course of the disease" (2018). Moreover, other participants mentioned some factors such as alcohol; poor diet, smoking, and insufficient physical activity can prone to diseases and proportionally influence a number of sick people. Actually, some factors coincided with information that I gathered from the Alzheimer's Association. For instance, based on Alzheimer's Association, some factors such as depression, harmful medicals, abusing alcohol, thyroid problems, and vitamin deficiencies can lead to deterioration of disorder. However, the other participant (biology teacher 2) said "Well, rather, it's all so, well, that would be my guess. Yes, it is possible that a very high rate the level of life where perhaps people do not rest

enough not a nervous system and the brain is not resting and the end, plus improper diet which vessels can become clogged and stop the supply of the required chemical and biological substances". Despite, all mentioned above factors, Down syndrome, cardiovascular disease are increasing the risk of appearance Alzheimer's disease. High age also adversely impacts on work and interaction of brain cells. In conclusion, the reasons of disorders are various but the main of them are losing the connection between neurons, atrophy some parts of the brain, which is responsible for functions such as memory, thinking and feeling ability, and formation plaques after accumulation proteins. Obviously, bad habits, poor diet, untimely examination by a doctor, and insufficient physical and mental work are entailed to the formation or deterioration of Parkinson's, Alzheimer's, and Dementia.

My second question of the research is <How to stop or prevent diseases associated with the CNS?> and my respondents replied me with different views. Participant of my study (Biology Teacher 1) said "For the brain is in principle very well help products that contain the b vitamins as the b vitamins, mainly restores and relieve irritability of the nervous system. That is, vitamins we have is found in nuts especially walnuts, also honey is very good; the lemon is what every person home. Also for the nervous system well helps rosemary." Additionally, the other participant (Neurosurgeon) answered to the same question but slightly different "If we talk about products that will help to improve the brain you need to eat blueberries, nuts, coffee, fish, turmeric, pumpkin seeds, oranges and eggs. Many products contain antioxidants and support the work of the brain". I suppose these products can prevent the destruction of connections between neurons. Actually, certain nutrients, such as omega-3 fats, coconut oil, vitamin B12, vitamin D, and probiotics improve the working ability of our brain. Respondents also mentioned that physical and mental work will reduce the symptoms of diseases and can help in preventing them. My next question from the interview was about what kind of physical or mental exercises can help during the treatment. Participant of my study (Biology Teacher 1) said "Frankly, for example, for Alzheimer's, I do not know such exercises. But for Parkinson's, they need therapy that is easy-physical culture for them is to maintain the tonus of the respiratory system we also aerobics".

However, my another participant (Biology Teacher 2) mentioned that mental work is equally important like exercises "No, I don't exercise I do not know but just assume that it is necessary to head to work you need the head coach all need to train not physical maybe but definitely to improve blood circulation, but also exercise for the mind crossword puzzles...". From these words, I understood that not only physical activity can help in preventing disorders, also brain work essential. Moreover, neurosurgeon responded that both activities should be done for preventing deterioration of diseases. Neurosurgeon mentioned "every day, 30 minutes of exercise will help to improve the cardiac and mental performance of the body. Perform certain specific exercises that can prevent the symptoms of the disease. Try more often to read and do mental strain. It will make your brain work...". Actually, all answers of my participants coincide with pieces of advice from the Columbia University Department of Neurology. From this site, I learned that half-hour of physical can improve cardiac and mental work of the body. According to their suggestion reading, solving crosswords and learning something new improve to improve memory and attention. Although, participants didn't mention the fact that the best way of preventing diseases is using antibodies, which can stop the ongoing development of beta-amyloid. Actually, MRI and CT are also helpful in the detection of disorders and can be useful in further development. To summarize all data I discovered the ways of preventing diseases, but no one of them can't say the precise methods of treatment. In their opinions, the disorders are incurable. Maybe, they didn't know about the contemporary methods of treatment or lack of highly-specialized doctors in Kazakhstan.

My third research question was <How to develop ways for treating the problems in Pavlodar?>. In this case, I explored the general ways of treatments and improving them in Pavlodar. After some investigation, I identified that in Pavlodar we haven't any opportunity for treating these disorders. However, in Kazakhstan located Center for the treatment of neurosis and Alzheimer's disease that can treat the diseases. According to words of neurosurgeon the methods of treatment in Kazakhstan is drugs "In Kazakhstan, in principle, treatment of these diseases is not practiced. There may be surgeries to keep the brain working, but to connect neurons and repair atrophied parts of the brain; we're not ready for that yet. In addition, the disease kills nerve endings such as synapse and neurotransmitters. Basically, in order to reduce the risk of brain damage, doctors often use donepezil, Galant amine, meantime, dopamine...". Actually, the words of neurosurgeon had a lot of similarities with information from the National Institute on Aging. For instance, they also suggested utilizing drugs such as donepezil, Galant amine, meantime, navistigmine, which can help to treat or prevent disorders. Unfortunately, our local hospitals are unhelpful in the therapy of troubles related to all types of Dementia. Actually, I asked their opinion and attitude about our local medicine. Neurosurgeon replied that "Unfortunately, personally, our hospital is not ready for such operations, even with all the desire we do not have such neurosurgeons, even our head Dyusembayev Rashid

Mikhailovich is not capable of such operations. Therefore, I consider that we have no such opportunity...". Additionally, on a question about improving methods of treatment in Pavlodar, he answered "Methods of treatment can be improved only through practice, but unfortunately we do not have such an opportunity. Although, if we are invited to the world-famous neurosurgeons, such as Alexander Konovalov, Dr Shalom Mikhovich, Professor Zvi Ram and they will conduct master classes, we will be able to learn and apply our knowledge in practice". I guess that we have good doctors who can prevent symptoms with surgical interference. But they need advanced training from the best neurosurgeons. In conclusion, I identified drugs, which use in treatment. Actually, it is one of the effective methods of treating symptoms. Unfortunately, our local medicine is still disabling to conduct operations. Despite, I hope our neurosurgeons will be able to manage such kind of quite complicated operations.

VI. CONCLUSION

I will summarize this research paper through an analysis of the relation of the research outcomes to my research purpose and research questions. The goal of my project was to identify reasons for a growth rate of mortality after CNS diseases. Moreover, investigate reasons for appearance symptoms and factors that can prone to deterioration. From the discussion above, a significant part of my research purpose was achieved, because I presented the main reasons and factors which affect the further development of disorders. I have answered all research questions stated in the study, as the main causes of disorders are atrophy of brain parts, the formation of plaques in the brain and poor diet, alcohol, stress, genetic diseases increase the likelihood of formation Alzheimer's, Parkinson's, and Dementia. Actually, after the investigation was identified that Pavlodar hospitals are disabled to conduct operations by treatment of troubles. Despite, we have some highly-qualified neurosurgeons but they need some master-class from the best doctors of neurosurgery in the world. Based on the outcomes of my study, I suggest for our citizens of Kazakhstan be aware of symptoms of diseases and factors that can lead to deterioration of disorders. Because the rate of mortality is still growing and the steps of prevention are not so complicated to do, that is why it is essential to prevent symptoms before worsening. My research paper expands knowledge on the topic, as there is insufficient data in regards to it in Kazakhstan and outcomes of my research increase awareness about reasons and consequences of them.

Evaluation: In this section of a research paper, I will evaluate the strengths and weaknesses of my research design and outcomes of the research paper. Actually, the significance of my project is detailed information about the mortality rate, causes, effects and treatment methods of CNS diseases in Kazakhstan. From primary and secondary sources I could get valid and credible data and analysis was based on comparison and evaluation of their responses with a secondary source. Additionally, respondents were able to avoid bias answers. Because, in the question which was related to Pavlodar treatment, they replied without prejudice. However, the main weakness of the research paper is the insufficient precise answer to my third research question. I could get a response for the first part of my research question but second part unexplored to the end. It is because of not enough investigation of secondary sources. Previously, I could not find any information related to the treatments method in Pavlodar and eventually it prone to incomplete answer to my question.

Further research: In this section of the research paper, I will describe suggestions for further research on my topic. Actually, my project needs some improvements for better result. First of all, I should increase the number of participants, more precisely the number of neurosurgeons. Because only they can give me sufficient answers to my question, eventually I will get good data for evaluation and analysis. Secondly, for further development of a project, I should add some extra questions for respondents and get more data for comparison and analysis. For instance, from secondary sources, I got a lot of useful materials, but in the analysis part, it was hard to evaluate them with replies of respondents. Indeed, if the data from primary sources will be enough I could be able to investigate and compare more information from secondary with primary sources. During the writing of my project, I collected a lot of information and analysed them properly. Obviously, my research paper is far from an ideal one, but for me, it was a good chance to gain knowledge and prepare for my future profession. Initially, I never thought that our nation is also suffering from CNS disorders, but during the investigation, I was shocked that these diseases are one of the common reasons for mortality in Kazakhstan.

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