

## Chapter 9

# Role of Diet, Functional Foods, and Nutraceuticals in Brain Disorders

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### ABSTRACT

*This chapter presents an overview of various complementary nutritional approaches for the management of brain disorders. Numerous epidemiological studies emphasize the growing burden of brain disorders worldwide. Due to the complex pathophysiology, lack of precise diagnostic and therapeutic options, there is growing need to have alternative approaches. One important strategy for the prevention and treatment of brain impairment is based on dietary supplements, functional foods, and nutraceuticals. The current chapter illustrates various aspects of available nutritional products for the brain disorder. Considering the recent surge in the nutritional products and as it destined to play an important role in future, existing regulatory framework is explained here which ensures purity, safety, and efficacy of the marketed products.*

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## **OVERVIEW OF BRAIN DISORDERS**

Brain disorders are part of neurological disorders, which are described by WHO as diseases of the central and peripheral nervous system. These disorders include Alzheimer disease and other dementias, Parkinson's disease, traumatic disorders of the nervous system due to head trauma, brain tumors, epilepsy, cerebrovascular diseases including stroke, migraine and other headache disorders, multiple sclerosis, neuroinfections, and neurological disorders due to malnutrition. Symptoms and severity of brain disorders vary greatly.

Many bacterial, viral, fungal and parasitic infections can affect the nervous system. Brain disorders may be caused by aging, illness, genetics, or traumatic injury. Furthermore, the extension of life expectancy and the aging of the general populations in both developed and developing countries are likely to increase the occurrence of many chronic and progressive physical and mental conditions including neurological disorders. Harvard School of Public Health, World Health Organization (WHO) and the World Bank conducted a collaborative study called 'The Global Burden of Disease (GBD) study' which states that the neurological disorders were seriously underestimated by traditional epidemiological and health statistical methods that take into account only mortality rates but not disability rates (Murray, Lopez, WHO, World Bank, & Harvard School of Public Health, 1996). Based on these results, World Federation of Neurology (WFN) and WHO conducted an international Survey of Country Resources for Neurological Disorders including 109 countries and covering over 90% of the world's population. The findings show that there is a lack of resources for patients with neurological disorders in most of the parts of the world; they highlight inequalities in the access to neurological care across different populations, especially in those living in low-income countries and in the developing regions of the world (Janca, Aarli, Prilipko, Dua, Saxena, & Saraceno, 2006). Gooch et al. (2017) reported the United States alone carries a substantial fiscal burden resulting from the nearly 100 million Americans with a neurological disease which is nearly 800 billion dollars and is rapidly rising due to the aging of the U.S. (Gooch, Pracht, & Borenstein, 2017). There are various risk factors associated with the brain disorders. Older age and family history are the most significant factors for the neurodegenerative diseases. Brain tumors can affect people at any age. The personal risk of the brain disorders depends on the genetics and exposure to environmental risk factors like radiation. The risk of brain disorders is higher if the patient has stressful life experiences or a traumatic brain injury.

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