

Chapter 18

Nurturing Student Well-Being in the Modern World: Nutrition and Its Effect on Cognitive Functioning

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ABSTRACT

This study explores people's views on the link between diet and cognitive performance, aiming to illuminate nuanced aspects. Using qualitative methods with college-age participants, it delves into knowledge, opinions on food, and barriers to dietary changes for cognitive health. Preliminary findings reveal diverse attitudes, contributing qualitative insights to existing knowledge. The results may impact public health, dietary guidance, and interventions for cognitive well-being, emphasizing the need to understand diverse perspectives for culturally sensitive strategies.

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1.0 INTRODUCTION

The relationship between nutrition and cognitive function is a multifaceted and important part of human health. Nutrition, the process by which the body absorbs and uses nutrients from food, is not only critical to physical well-being, but also plays an important role in maintaining optimal cognitive function. Cognitive functioning involves a variety of mental processes, including memory, attention, problem solving, and decision making, all of which are directly affected by the quality and appropriateness of foods consumed. Key nutrients such as omega-3 fatty acids, antioxidants, vitamins (such as B vitamins and vitamin D), and minerals (such as iron and zinc) have been found to have important effects on brain health and cognitive performance. For example, omega-3 fatty acids in certain foods are associated with improved cognitive function, while antioxidants in fruits and vegetables promote brain health and reduce the risk of cognitive decline. In addition, during critical developmental stages, especially during pregnancy and early childhood, adequate nutrition is crucial for optimal brain growth and cognitive development. Understanding the complex relationship between nutrition and cognitive function is important not only for individual well-being, but also for designing strategies and interventions to improve cognitive ability and mitigate cognitive decline.

Gut-Brain Connection

Knowledge of the two-way communication between the gut and the brain has revealed a complex system that not only regulates gastrointestinal functions, but also significantly affects emotions, motivation and higher cognitive processes. This complex network, known as the “**gut-brain axis**” (GBA), controls the functioning of the gut by integrating it with the emotional and cognitive centres of the brain. This relationship involves various mechanisms such as immune responses, intestinal permeability, enteric reflexes and hormonal signals, all of which **are** mediated by **neuroimmune-endocrine** factors. The GBA involves the central nervous system (CNS), including the brain and spinal cord, the autonomic nervous system (ANS), the enteric nervous system (ENS), and the hypothalamic-pituitary-adrenal (HPA) axis. The autonomic system, which consists of sympathetic and parasympathetic branches, sends signals from the gut to the central nervous system and vice versa via both afferents and efferents. The HPA axis, an important part of the limbic system involved in memory and emotion, is at the **heart** of the stress response system. Stress and elevated proinflammatory signals activate this **axis and trigger** the release of hormones such as cortisol, a major stress hormone that profoundly affects various organs, including the brain. Thus, the brain influences the functions of various intestinal cells, such as immune cells, epithelial cells, enteric **neurons, etc.**, through

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