

THE EFFECT OF PROTEIN-ENERGY MALNUTRITION ON THE PHYSICAL AND MENTAL DEVELOPMENT OF CHILDREN

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Abstract:

Protein–energy malnutrition is one of the major global health problems and affects millions of children, particularly in developing regions. Although its impact on physical growth has been widely studied, long-term nutrient deficiency also significantly influences brain development and mental health. Adequate nutrition during early childhood is essential for neuronal growth, synapse formation, and myelination processes. Long-term deficiencies of proteins, essential fatty acids, iron, and iodine may disrupt these processes and lead to structural and functional changes in the brain. This study analyzes the relationship between chronic nutritional deficiency and alterations in brain development as well as psychological outcomes in children.

Materials and Methods:

The study was conducted among primary school children aged 7–8 years. A total of 120 pupils from general education schools were examined. Anthropometric measurements, including height and body weight, were obtained for all participants, and body mass index (BMI) was calculated using standard pediatric formulas. Based on age-adjusted BMI values, the children were divided into two groups: a low BMI group (BMI below the age norm) and a normal BMI group. From the total sample, 34 children (28.3%) were identified as having a BMI below the age norm. These children underwent additional clinical and laboratory examinations to identify possible health problems. The evaluation included a complete blood count to detect anemia, biochemical blood analysis to determine calcium and phosphorus levels, and clinical assessment of gastrointestinal function. In addition, medical history was collected to determine the presence of chronic digestive system diseases. The results showed that among children with low BMI, 41.2% had signs of anemia, 29.4% had reduced calcium levels, and 23.5% had decreased phosphorus levels. In addition, 26.5% of children in the low BMI group had gastrointestinal disorders, including functional dyspepsia and chronic gastritis, either as symptoms or previously diagnosed conditions. Academic performance and school attendance were also analyzed using school records. It was found that children with low BMI had significantly lower academic performance

compared with children whose BMI was within the normal range. Furthermore, children in the low BMI group missed more school days due to medical examinations and treatment related to their health conditions.

Thus, the study focused not on chronic malnutrition itself but specifically on school-aged children with low body mass index. The findings indicate that children with low BMI more frequently experience anemia, mineral deficiencies, gastrointestinal disorders, decreased academic performance, and increased school absenteeism due to health-related issues.

Conclusion:

Chronic nutritional deficiency can significantly affect brain development and mental health in children. Early nutritional support and strengthened public health interventions are essential to ensure optimal cognitive and psychological development in children.

Result:

Thus, the study focused not on chronic malnutrition itself but specifically on school-aged children with low body mass index. The findings indicate that children with low BMI more frequently experience anemia, mineral deficiencies, gastrointestinal disorders, decreased academic performance, and increased school absenteeism due to health-related issues.