

Article 16: Human Development and Nutrition Issues

The relationship between **human development** and **nutrition issues** constitutes a two-way, cyclical phenomenon. Adequate nutrition is a cornerstone of human development, contributing to **physical** (Centers for Disease Control and Prevention, 2022; Sheng et al., 2025), **cognitive** (Lohman et al., 2023; Shankar et al., 2017), and **psychosocial well-being** across different life stages. Conversely, poor nutrition hinders development and can lead to poor outcomes at the individual and societal levels.

Nutrition issues and Physical Development

Nutrition issues are directly and profoundly related to physical development throughout a person's lifespan, from the prenatal stage all the way through adulthood. A balanced diet is essential for building and maintaining all body functions required for growth and maturation. Any nutritional imbalances, whether those are linked to lacking or excessing food intake, can lead to serious and often irreversible physical consequences (Centers for Disease Control and Prevention, 2022; Sheng et al., 2025).

The National Health and Nutrition Examination Survey (NHANES) is an ongoing study conducted by the National Center for Health Statistics (NCHS) to assess the health and nutrition of children and adults in the United States. It combines in-home interviews about diet, lifestyle, and health history with physical examinations and laboratory tests carried out in mobile health centers. The survey oversamples certain populations, such as older adults, racial and ethnic minorities, and low-income individuals, to provide more reliable national estimates. Data include detailed measures of nutrition, obesity, cholesterol, hypertension, and both diagnosed and undiagnosed diseases. The survey has constantly documented high rates of obesity and diet-related risk factors for chronic illness in the U.S. population. By collecting measured rather than self-reported data, NHANES is able to identify health burdens that would otherwise go unnoticed. These findings show that poor nutrition not only contributes to chronic diseases but can also hinder healthy physical growth and development, especially in children and adolescents. The study highlights that understanding these nutrition-related patterns is critical for promoting development and guiding interventions to improve dietary habits and overall health nationwide (Centers for Disease Control and Prevention, 2022).

Another study looked at the relationship between maternal macronutrient intake during pregnancy and the physical growth of their children from infancy through childhood. It utilized data from the Growing Up Study 2 (GUTS2), which tracked the dietary habits of mothers and the physical health of their children over time. Food frequency questionnaires were used to look at the diets of mothers, and standard height and weight tests were performed to measure the growth of children. The researchers found that children grew faster when their mothers had more protein and fat intake. Conversely, lower consumption of these nutrients was associated with slower growth trajectories. These findings suggest that a mother's dietary intake during pregnancy can significantly impact her child's physical development. It also demonstrated that early dietary factors can affect long-term health outcomes. Researchers came to the conclusion that promoting a balanced maternal diet is essential for children's physical development. Overall, the study provided evidence supporting the strong link between a mother's diet while pregnant and the way her child develops over time (Sheng et al., 2025).

Nutrition issues and Cognitive Development

Inadequate or unbalanced nutrition is strongly linked to impaired cognitive development, particularly during critical growth periods such as fetal development and early childhood. Additionally, malnutrition leads to structural and functional abnormalities of the brain that can result in learning, memory, and behavioral deficiencies throughout several stages of life (Lohman et al., 2023; Shankar et al., 2017).

A systematic review examined how food insecurity impacts children's cognitive development, academic performance, and emotional well-being. Therefore, the authors included 23 peer-reviewed studies from the United States (21), Canada (1), the United Kingdom (2), and Australia (1). The target age groups included infants, toddlers, preschoolers, school-age children, and adolescents. Data were obtained from caregivers and standard assessments of child behavior and academic achievement. Findings revealed that even marginal levels of food insecurity were associated with cognitive delays, attention deficits, and academic struggles across all age groups. Notably, these effects persisted even after controlling for economic factors. The researchers found that food insecurity is a significant risk factor for developmental and behavioral issues in children. The authors stressed the importance of universal screening for food insecurity in pediatric medical environments. Additionally, they recommended that children from disadvantaged households receive quality developmental assessments and interventions. Ultimately, food insecurity can lead to learning, attention, and cognitive development challenges, regardless of culture (Shankar et al., 2017).

Another study investigated the relationship between diet quality, food insecurity, and cognitive function in middle-aged or older adults. Following that lead, the researchers assembled data from the Health and Retirement Study, which contained diet, health, and income information. They also relied on the Alternative Healthy Index to measure diet quality and standardized tests for cognitive performance. Results revealed that better diet quality correlated with greater cognitive performance over time. Food insecurity alone was significantly associated with lower cognitive performance, potentially indicating a lack of access to nutritious foods. In summary, older participants' cognitive health was largely influenced by the nutritional intake. Food insecurity and dietary quality may serve as strategies to mitigate cognitive decline in older adults. Accordingly, the authors advocated for policies to increase food security among those groups most likely to experience food insecurity (Lohman et al., 2023).

Nutrition issues and Psychosocial Development

The relationship between nutrition and psychosocial development is complex, as one can influence the other. What people eat influences the structure and functions of their brain, which helps regulate behavior and emotional health. Similarly, psychological and social factors affect the way people eat, and they can lead to nutritional problems (King, 2018; Suárez-López et al., 2023).

For instance, a study investigated the impact of a child's nutrition and home environment on the psychosocial development of preschoolers. The study included 275 children aged 3 to 5 years from an urban area, evaluating nutrition through mid-upper arm circumference (MUAC) and psychosocial stimulation via the HOME inventory. The researchers collected data by taking physical measurements and speaking with caregivers. They found that children exposed to elevated levels of psychosocial

stimulation at home exhibited enhanced social and emotional competencies. Adequate nutrition also contributed to those outcomes; however, the impact of nutrition was primarily influenced by the quality of psychosocial stimulation. The research determined that augmenting both nutrition and home stimulation can improve psychosocial well-being in young children. These results show how important it is for children to have supportive homes for their social and emotional growth. Researchers advocate for interventions aimed at delivering nutritional assistance and facilitating interactions within the home environment. Overall, the research stresses that experiences and care settings in the early years are important for psychosocial growth (Suárez-López et al., 2023).

On that same note, a U.S. study explored how food insecurity shapes children's social and emotional well-being in fragile families. For this purpose, researchers gathered long-term data from the Fragile Families and Child Well-being Study, which monitored children over time. The data included both household food insecurity and child-specific food insecurity, alongside reports of behavioral problems. Caregivers were polled in a succession of repeated survey waves that enabled the researchers to understand shifts and patterns in children's behavior. The findings showed that children's direct experience of food insecurity was more strongly tied to behavioral problems than household insecurity alone. Externalizing behaviors, such as aggression and hyperactivity, were particularly linked to child food insecurity. In contrast, internalizing issues, like anxiety and depression, were linked to household-level food shortages. These results suggest that nutritional struggles and uncertainty about food contribute to children's emotional and behavioral challenges. The study concluded that reducing child-specific food insecurity can lessen behavioral problems in vulnerable families. The authors pointed out that policies and interventions must focus on children's direct nutritional needs to support healthier psychosocial development (King, 2018).

References

- Centers for Disease Control and Prevention. (2022, August 8). *National Health and Nutrition Examination Survey (NHANES)* . Wwww.cdc.gov. <https://www.cdc.gov/nchs/hus/sources-definitions/nhanes.htm>
- King, C. (2018). Food insecurity and child behavior problems in fragile families. *Economics & Human Biology*, 28, 14–22. <https://doi.org/10.1016/j.ehb.2017.11.002>
- Lohman, M. C., Wei, J., Bawa, E. M., Fallahi, A., Verma, M., & Merchant, A. T. (2023). Longitudinal associations of diet, food insecurity, and supplemental nutrition assistance program use with global cognitive performance in middle-aged and older adults. *The Journal of Nutrition*, 154(2). <https://doi.org/10.1016/j.tjnut.2023.12.042>
- Shankar, P., Chung, R., & Frank, D. A. (2017). Association of food insecurity with children’s behavioral, emotional, and academic outcomes. *Journal of Developmental & Behavioral Pediatrics*, 38(2), 135–150. <https://doi.org/10.1097/dbp.0000000000000383>
- Sheng, C., Liu, B., Chavarro, J., Hart, J. E., Zhang, C., Wang, M., & Sun, Q. (2025). Maternal macronutrient intake at pregnancy and offspring growth trajectory through childhood: a prospective analysis in the Growing Up Today Study 2 cohort. *The American Journal of Clinical Nutrition*, 121(4), 843–852. <https://doi.org/10.1016/j.ajcnut.2025.01.032>
- Suárez-López, L. M., Bru-Luna, L. M., & Martí-Vilar, M. (2023). Influence of nutrition on mental health: Scoping review. *Healthcare*, 11(15), 2183. <https://doi.org/10.3390/healthcare11152183>