

**Beyond empty plates: Impact of food insecurity on early  
childhood development**

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### **Abstract**

Food insecurity impacts millions of children worldwide, including 2.5 million children in the UK who lack consistent access to nutritious food. This paper investigates the detrimental effects of food insecurity on early childhood development, focusing on physical, cognitive and behavioural development. The first 1000 days are critical for child's brain and body development, therefore nutritional deficiencies during this period can lead to stunted growth, weakened immunity and cognitive impairment such as poor memory due to low iron levels. Furthermore, food insecurity is associated with behavioural changes in children such as externalizing behaviours like aggression and internalizing behaviours like anxiety. This paper highlights the need for thorough strategies, including government policies, community level initiatives and educational programs for parents to address and increase awareness about food insecurity. By incorporating these interventions to improve food accessibility, these measures can support the developmental requirements of at-risk children. Further research is suggested to develop targeted solutions, to avoid lasting impacts on health and development in children.

*Keywords:* food insecurity, nutritional deficiency, cognitive impairment, child health, parental education

## **Beyond Empty Plates: Impact of Food Insecurity on Early Childhood Development**

Millions of children tonight are facing a harsh reality: empty plates in a land of plenty! Food insecurity is when people don't have reliable access to enough affordable, nutritious food. Even though high-income countries like the UK generally have lower rates of food insecurity, it's alarming that approximately 2.5 million children in the UK still don't have access to safe and nutritious food needed for proper development (UK Parliament, 2021). This lack of food security can have serious consequences for children's growth, learning, and overall health.

The early years, up to age five, are critical for child development, laying the groundwork for future cognitive and social skills. A recent study found that food insecurity during this crucial phase can be particularly harmful, directly disrupting children's brain and physical growth and indirectly impacting parental well-being (Johnson & Markowitz, 2017). The lack of access to nutritious food for children can lead to a range of health problems, making them more prone to illness. (Gallegos et al., 2021).

The purpose of this literature review is to explore the association between food insecurity and early childhood development. It is hypothesized that food insecurity is strongly associated with stunted physical growth, cognitive impairments and behavioural challenges, requiring targeted interventions. While existing research often examines the effects of food insecurity on these domains in isolation, there is a limited integration of findings specific to early childhood development. By synthesizing findings from these domains, this paper aims to identify gaps and patterns that may not be evident in individual studies.

## Discussion

A significant consequence of food insecurity on children's growth is the occurrence of stunting. Until the age of 5 years, children's brain and body develop more quickly, but a lack of food during this period significantly impacts a child's physical growth e.g., not growing as tall as they should (Egan et al., 2016). Children who do not receive necessary nutrients are more susceptible to infections and illness, and their body may find difficulty to recover from common colds due to a weakened immune system (Ke & Ford-Jones, 2015).

The initial 1000 days from a child's birth are considered the most crucial for healthy brain development, representing a particularly sensitive stage for growth. A lack of nutritional rich food during this period can lead to learning challenges and low numeracy rate and short term memory (UNICEF, 2013). Among the essential nutrients, iron plays a crucial role during this time. It is vital for brain development and function, supporting the formation of pathways that enhance cognitive performance. Iron deficiency, commonly caused by inadequate dietary intake, can lead to iron deficiency anemia (IDA), which is associated with low oxygen carrying capacity in the blood, cognitive impairments, and fatigue. Research has shown that anaemic children have lower intelligence quotients (IQs; Grantham-McGregor & Ani, 2001), with one meta-analysis reporting an improvement of 2.5 IQ points (95% CI [1.24, 3.76]) in anaemic participants after iron supplementation (Samson et al., 2022). This underscores the importance of addressing iron deficiencies to improve both cognitive development and academic performance. Since children have rapid growth up until the age of 5 years, this increases their requirement for iron, so if children do not get essential iron, it puts them at risk for iron deficiency anaemia. This condition negatively impacts cognitive areas in the brain such as intelligence, especially if it occurs early in childhood (Roberts, 2022).

A study examined the long term effects of food insecurity on childhood educational outcomes and found that food insecure children are more likely to struggle academically, with lower reading and math scores compared to their peers. The researchers highlight that stress and anxiety linked with food scarcity can impair concentration and learning. These findings emphasize the need for interventions not only for addressing nutritional deficits, but also the psychological effects, food insecurity places on children (Hanson & Connor, 2014).

Studies have found that food insecurity is a strong trigger for behavioural problems and social interactions such as externalizing and internalizing behaviours in preschool children (Chen & Wei-Jun Jean Yeung, 2024a). A study conducted post Great Recession of December 2007–June 2009 found that children who face problems of not having enough food to eat between kindergarten and first grade for a long period of time, show signs of frustration and feeling sad (Kimbrow & Denney, 2015). Having limited access to nutritious food in preschool children may lead them to exhibit externalizing behaviours such as biting, crying and throwing tantrums, which is their way of expressing frustrating feelings or attention. On the other hand, internalizing behaviours in this age group may lead to extreme clinginess, shyness and recurrent sadness, which may imply that the child is struggling with anxiety (Chen & Wei-Jun Jean Yeung, 2024b).

These studies show the significant impacts of food insecurity on early childhood, linking nutritional deficiencies to cognitive impairments and academics struggles, while also emphasizing behavioural outcomes such as aggression and anxiety. Together, these studies highlight the interconnected nature of these effects but lack exploration into external influences such as family dynamics, that can shape outcomes. Future studies should investigate parental mental health and access to social support in shaping developmental outcomes. Research combining nutritional and behavioural support could offer practical strategies for addressing food insecurity.

Food insecurity in early childhood can lead to irreversible impacts on a child's development, makes it important to use a strategy that uses government policies, technological advances, and community level actions. Start programs that offer nutritional education to parents and caregivers, equipping them with knowledge and skills to prepare nutritious, well-balanced meals for children on a budget. Applying practical learning activities into preschooler's programme such as cooking lessons and taste tests will not only teach children about having a healthy relationship with food but they also promote sensory experience and motor function development.

Community based support systems that provide food resources and emotional support to families can be implemented to address the psychological impact of food insecurity in children. This can be held at local community canter, where families have access to food banks and mental health support in a welcoming environment. This strategy not only reduces psychological effect of food insecurity over time but can also improve families overall resilience and stability in the long run.

There is also an urgent need for Government policy reforms and strategies to encourage more domestic production and find different protein sources. Government organizations should encourage parents and caregivers to start gardening in their backyard or even balconies to adopt climate smart farming using innovative technologies. Implementing solutions that address the economic inequalities are vital to address food insecurities (Carney et al., 2011).

## Summary

The evidence presented supports the hypothesis that food insecurity is strongly associated with physical growth, cognitive impairments and behavioural outcomes in early childhood. Pre-school children need healthy and nutritious food to grow, learn and become more active. These studies show that nutrient rich food helps children's brains to develop quicker and become socially interactive, leading them to be healthier in life.

What comes next? More research focusing on UK pre -school children is necessary to understand the implications of food insecurity (Aceves-Martins et al., 2018). Additionally, solutions of more pragmatic strategies and policies are needed to ensure that all preschool children get nutritious food for healthy development. By focusing on these strategies, significant progress can be made in supporting children to achieve a strong foundation for their future.

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