



Feature

A generational struggle to feed a healthy brain

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For more on **defining child poverty in the UK** see

<http://www.cpag.org.uk/content/what-is-poverty> and <http://www.cpag.org.uk/content/childpovertyfactsand-figures>

For more on **food poverty** see

<https://www.youtube.com/watch?v=yVBJM-TOeLw>

For **Sinéad Furey's End Hunger UK blog** see <http://endhungeruk.org/uk-food-poverty-now-public-health-emergency>

For more on **Children's Future Food Inquiry** see <https://foodfoundation.org.uk/wp-content/uploads/2019/01/Childrens-Future-Food-Inquiry-Spreads.pdf>

For **Feeding the brain and nurturing the mind** see

Proc Natl Acad Sci USA 2015; **112**: 14105–12

For more on the **effects of physical activity, nutrition and obesity on cognition** see

Adv Nutr 2011; **2**: 2015–6S

For more on the **End Child Poverty Coalition** see <https://www.endchildpoverty.org.uk/>

The poverty line in the UK is defined as a household income below 60% of the national average (according to the relative income poverty approach), and child poverty has now reached harrowing proportions. The UK National Education Union (NEU), in response to an independent poll completed by 1026 NEU members between Nov 23 and 26, 2018, go so far as to say that the poll paints a Dickensian picture, with an admonitory tone toward a government increasingly “out of touch with the distressing new reality of children’s daily lives”. With about 30% of children in the UK living in poverty, what might the consequences be for the neurodevelopment of our young generation?

Janet Clark (Equalities, Social Justice, and International NEU Lead Officer) tells *The Lancet Neurology* that there are “many examples of teachers and schools providing food, clothing, equipment, money, and household items” to families in need. She says that poverty is “impacting people across the country in rural, coastal, urban, and deindustrialised areas”. Many schools run free breakfast clubs and foodbanks and provide free school dinners for children who don’t qualify for free school meals because their parents work but are unable to provide regular lunch money. She refers to 53% of respondents to the survey (25% in primary and 75% in secondary education) who believe that children from their school will go hungry over Christmas (with 39% saying they did not know), adding that she knows of one school that opened its kitchen for its students on Christmas Day. All these findings from the poll certainly raise serious questions as to how the fifth largest economy might be letting down its young generation. The NEU’s research indirectly measures the impact of poverty and hunger on learning through absence from school (83% of respondents), lateness (79%), behavioural issues (85%), and impaired concentration (81%) and health (59%). Additionally, there is the associated social stigma.

The NEU are not the only ones claiming that food insecurity is now a national emergency. Dr Sinéad Furey, lecturer and researcher at Ulster University Business School (Coleraine, UK), and policy advisor to End Hunger UK, speaks to *The Lancet Neurology* about food insecurity and the impact of hunger on students and their capacity to concentrate during lessons, “[This] may ultimately affect their educational attainment, life chances, and potential to be meaningfully economically active in adult life”, she says. Furey shares her experience from the Children’s Future Food Inquiry (#Right2Food) Evidence Hearing at Stormont, Belfast, where Youth Ambassadors presented “powerful, emotive, and compelling evidence”, and she witnessed the shame felt in vulnerable working families who simply cannot afford to feed themselves. Furey warns of a potential

“new epidemic and mental health emergency” from widespread stress and anxiety associated with food poverty.

Turning to clinical evidence, what relationship is there between nutrition and cognition in children, and can this evidence feed into policy and make a difference to young populations? One 2015 paper, *Feeding the Brain and Nurturing the Mind*, examined the role of the human gut, and suggests that “persistent gut microbiota immaturity” found in undernourished children affects specific regions of the brain that are “critically involved in various higher cognitive functions such as the brain’s default mode network”. The message from the authors could not be clearer: feeding children’s gut microbiota will help to feed their developing brains. But it is not simply a matter of feeding, it is also about the nutritional value, add the authors. The sharp rise in childhood obesity prevalent in, but not limited to, low-income households, is caused by a complexity of socioeconomic factors. However, increased energy consumption tactics to combat hunger—foods rich in calories, low in nutrition—not only carry severe health risks, but also have implications for cognitive health and academic performance. This finding was reported in a 2011 review paper that assessed the effects of physical activity, nutrition, and obesity on cognition.

“Providing the right building blocks for the brain to create and maintain connections is critical for improved cognition and academic performance”, say the authors of the review. This crucial period for brain development starts in gestation. Studies show a direct association between increased consumption of energy from protein and improved cognitive performance in children. Interestingly, even short-term fasting (ie, missing breakfast) can produce “transient decreases” in cognitive performance and, conversely, consuming a balanced meal showed “marked, positive changes in disposition, attentiveness, and motivation”. The authors concluded: “The underconsumption and overconsumption of energy and excess body mass have been linked to deficits in academic achievement in school age children as well as a greater decay of brain structure and function during ageing”.

That such a high proportion of children in the UK are facing food poverty is deeply concerning. If children from economically disadvantaged households are forced to skip meals, and there is ample evidence that their cognitive health might be impaired as a result, this inequality discriminates and undervalues the welfare of an already underprivileged group. In May this year, the End Child Poverty Coalition, of which the NEU is a member, will publish child poverty statistics for each constituency and use these to lobby policymakers, reminding them that each statistic represents a child’s future.

Jules Morgan