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What if a focus on early brain health provided cognitive health for life?

Mindscape

Within Reach

Transiti

Visionar

Early integration of cognitive health in education and youth-focused public policy helps build cognitive reserve for lifelong mental resilience, lowered dementia risk, and cognitive health in later years.



UNCERTAINTIES

Technology, Values

MEGATREND (Most significant)

Advanced Health and Nutrition

TRENDS

Longevity & Vitality Neuroscience Precision/Personalised Medicine

TECHNOLOGIES

Artificial Intelligence Brain–Computer Interfaces (BCI) HealthTech

SECTORS IMPACTED

Education Data Science, AI & Machine Learning Health & Healthcare Insurance & Reinsurance

KEYWORDS

Alzheimer's Disease Brain Resilience Cognitive Reserve Digital Dementia Neurological Disorders





WHY IT MATTERS TODAY

One in three people is affected by neurological conditions.⁵⁴⁰ The burden of neurological disorders has increased over the past 25 years because of population growth and ageing,⁵⁴¹ with dementia projected to affect 153 million people by 2050.⁵⁴²

Although a family history of Alzheimer's (a type of dementia) increases people's risk, the disease often results from a combination of genetic, lifestyle and environmental factors,⁵⁴³ and organ ageing.⁵⁴⁴ While most studies on dementia focus on later life, having a higher cognitive reserve (CR) throughout life is associated with lower dementia risk later on.⁵⁴⁵ CR builds resilience against future cognitive decline through education as well as social, physical and other activities.⁵⁴⁶

High CR earlier in life lowers dementia risk by 18% and dementia risk reduction is greater with education, particularly in primary school.⁵⁴⁷ Higher CR in mid-life lowers dementia risk by 9%, with particular benefits coming from job complexity, social interaction, problem-solving, and data analysis.⁵⁴⁸ Higher CR in late life lowers dementia risk by 19%, particularly through social connection.⁵⁴⁹ Physical activity throughout life shows beneficial effects on cognitive health as well.⁵⁵⁰

While the impact of technology on cognitive health remains understudied, especially as artificial intelligence (AI) reshapes daily work and life,⁵⁵¹ over-reliance on AI risks reduced metacognition and other skill loss.⁵⁵² Metacognitive skills – the ability to reflect on how one thinks and completes tasks – are essential for effective human–AI interaction,⁵⁵³ as deep reliance and dependence on AI may diminish critical thinking and creativity⁵⁵⁴ as well as weaken memory and spatial skills, raising concerns about 'digital dementia' and structural brain changes.⁵⁵⁵ This is an emerging area of research, but factors thought to promote cognitive health include human oversight of AI instead of relying entirely on AI, metacognitive skills training,⁵⁵⁶ and good dietary choices, such as green, leafy vegetables, fatty fish, berries and walnuts.⁵⁵⁷ The risk of poor cognitive health may increase due to poor sleep quality caused by excessive device use (five to eight hours per day),^{558, 559} viral infections such as COVID-19 (in one study, 80% of patients showed cognitive impairment within months of recovery⁵⁶⁰), and fungal infections such as *Candida albicans*, which may contribute to Alzheimer's and other neurodegenerative diseases.⁵⁶¹ Even social isolation, a lack of physical activity, and pollution may be factors.⁵⁶² BENEFITS

RISKS

Reduced risk of future cognitive decline; improved

educational outcomes;

promotion of healthy ageing.

Limited evidence; not universally

accessible; approach to cognitive health not sustainable

in the long term.

THE OPPORTUNITY

A focused and integrated approach to cognitive health among children and youth enhances cognitive health throughout life⁵⁶³ by building cognitive resilience, neural flexibility, and CR.⁵⁶⁴

Policies focused on cognitive health across sectors – such as health, education and other areas of public policy – can help individuals stay cognitively healthy as they age. By incorporating factors and activities that strengthen cognitive health, and avoiding those that weaken it, targeted interventions can promote optimal cognitive development.⁵⁶⁵ Strengthening cognitive skills supports mental health⁵⁶⁶ and makes learning more effective,⁵⁶⁷ preparing future generations for potential cognitive challenges.

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