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The impact of egg consumption on cognitive function: a systematic literature review

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Eggs provide several nutrients that have been linked to neurological function. Phospholipids, which comprise 30% of lipids in egg yolk, modulate neurotransmitter receptors and have been shown to lower reaction time in healthy adults(1). Eggs are also high in choline (340mg per egg), a building block for acetylcholine, a neurotransmitter involved in memory, learning and attention(2). Finally, eggs contain the omega-3 fatty acid docosahexaenoic acid (DHA) (25mg per egg), which has roles in neurological function including neurogenesis, synaptic plasticity and myelination(3). The impact of whole egg consumption on cognition has not been widely explored. This systematic review aimed to consolidate studies that investigated frequency of egg consumption or egg-supplemented diets on cognitive function. This review followed PRISMA guidelines and involved a search of five databases (Ovid Medline, Embase, CINAHL Plus, SCOPUS, and PsychInfo) from inception until April 2023. Included studies examined the link between whole chicken egg consumption and brain function, including cognitive decline, memory, risk-taking, reaction-time, decision-making, and executive function, in healthy adults (aged>16 y). All studies underwent risk of bias assessment. Twelve studies were included in the review. Four were prospective cohort studies, 4 were retrospective, 3 cross-sectional and 1 was a randomised controlled trial (RCT). Participant numbers, with the exception of the RCT, ranged between 178-9028 and were aged between 42-97 years. Duration of prospective studies varied from 2-5 years. Egg intake was measured via food frequency questionnaires (n = 8), 24-hr diet recalls (n = 2), a 4-day food record (n = 1) and a 7-day food record (n = 1). The RCT provided 2 DHA-fortified eggs/day compared to 2 whole eggs/day for 8 weeks. The primary outcome across 9 studies was cognitive decline, followed by memory (n = 7), reaction-time (n = 2), attention (n = 2), and executive function (n = 1). For outcome measures, studies used 9 different validated task-oriented tools (including the Montreal Cognitive Assessment n = 3, and California Verbal Learning Test n = 2), or 4 self-completed questionnaires. Several studies found no significant associations between egg consumption and cognitive decline (n = 4) or memory (n = 2). Conversely, 5 studies reported significant inverse associations between egg consumption and rates of cognitive decline. The RCT found that reaction-times were faster on both whole eggs and DHA-eggs after 8 weeks (p>0.05 between groups). Although conflicting results were found, more studies showed a greater frequency of habitual egg consumption to be associated with reduced cognitive decline. However, the variety of outcome measures across studies make direct comparisons challenging, preventing definitive conclusions about the impact of eggs on cognitive health. This review highlights the need for future RCTs.

Keywords: eggs; cognition; DHA; phospholipid

Ethics Declaration

No

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