

Association of iron deficiency with or without anaemia and cognitive functions among primary school children in Malaysia

ABSTRACT

Iron deficiency and anaemia affect millions of children worldwide. This study aimed to investigate the effect of iron deficiency with or without anaemia on cognitive functions, specifically with short-term memory, attention and visuo-motor coordination in children. A total of 173 primary school children was enrolled. Cognitive functions were assessed using the Wechsler Intelligence Scale for Children. Three sub-tests were selected to assess processing speed (coding test), immediate auditory memory (digit span test) and visual processing and problem solving ability (maze test). The results showed significant correlation between age and coding test ($r = 0.38$, $p < 0.001$), digit span test ($r = 0.16$, $p = 0.028$), and maze test scores ($r = 0.28$, $p < 0.001$), and the total sub-test scores ($r = 0.43$, $p < 0.001$). After age adjustment of the cognitive function tests, iron deficient children without anaemia scored significantly lower than the healthy children ($p < 0.001$) on coding test, while iron deficient children with anaemia and iron deficient children without anaemia scored significantly lower ($p < 0.001$) than the healthy counterparts on maze test. No significant differences were observed on digit-span score among the groups. This study confirms the negative effect of both iron deficiency and iron deficiency anaemia on processing speed and visuo-motor coordination in children.

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