Voluntary dehydration is a condition in which humans, while exposed to excessive insensible water loss, do not drink appropriately in the presence of adequate fluid availability. Poor hydration status has been linked to sub-optimal cognitive performance in adults. To date, there is only one observational study that shows the effect of dehydration on cognitive performance in school children.

The aim of this study was to investigate the relationship between hydration status and cognitive performance by examining the effects of water supplementation.

The effect of hydration on cognitive performance was investigated in 167 children (86 girls; 81 boys) aged from 9 to 11 years, in a hot climate country. They were tested for hydration status, based on urine osmolality, twice (morning/afternoon). Classes were randomly divided into an intervention group, who received water supplementation, and into a control group, who drank their customary amounts of water. The children’s cognitive abilities on short-term memory were assessed twice immediately after urine sampling (morning/afternoon).

The results showed a high prevalence of dehydration (83%) in children and a negative correlation between urinary osmolality and auditory number span.

High urinary osmolality is linked with dehydration. Therefore, drinking water during a school day can influence some aspects of cognitive performance such as short-term memory.