

Characterization of Physical and Cognitive Performance and Hydration in Older Adults

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ABSTRACT

In younger adults, dehydration has been shown to impair physical and cognitive performance. Older adults are habitually hypohydrated alongside experiencing physical and cognitive performance deficits. Despite these deficits, the link between these factors remains unexplored. **Purpose:** To examine the effect of hydration status on physical and cognitive performance in older adults. **Methods:** Sixteen (5 men and 11 women) community-dwelling adults (74±7yr; 78.2±15.0kg; 161±11cm) completed measurements of hydration status (urine specific gravity [USG], urine color), bioelectrical impedance analysis (lean mass, fat mass, total body fluid, intracellular to extracellular fluid ratio [ICF: ECF]), blood pressure, physical performance (handgrip strength test, sit-to-stand test, and a timed-up-and-go test), and reaction time (Flanker task). Hierarchical cluster analysis was performed on the distance matrix of USG and urine color to group participants. One-way ANOVAs were performed to determine differences among groups. **Results:** Hierarchical cluster analysis assigned participants to 4 groups (group₁, n=3; group₂, n=4; group₃, n=5; group₄, n=4). Consistent with the cluster analysis, each group had significantly ($p<0.001$) different urine color (group₁: 1.0±0.0, group₂: 2.3±0.3, group₃: 4.2±0.4, group₄: 6.0±0.0). In addition, the reaction time was significantly different among groups. For group₁, compatible and incompatible tasks (compatible: 1116±71.7s, $p=0.049$; incompatible: 1205±13.4ms, $p=0.042$) had a longer response time compared to group₂ (compatible: 640±67.5ms; incompatible: 688±74.0ms), group₃ (compatible: 725±67.4ms; incompatible: 796±174.2ms), and group₄ (compatible: 731±139.8ms; incompatible: 782±122.7ms). No significant differences were observed for lean mass, fat mass, total body fluid, ICF:ECF, blood pressure, handgrip strength, sit-to-stand test, and time-up-and-go test. **Conclusion:** Despite grouping by USG and urine color, no relationship was observed between body composition and physical performance. Surprisingly, hydrated individuals performed poorly cognitively compared to less hydrated individuals. We suggest these differences may reflect varying individual cognitive functions, not hydration status, among free-living older adults.