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Relationship between hydration status and psychological tests in Spanish schoolchildren aged 7-11 years


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Questionnaire design to evaluate water balance

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Introduction: Body water balance is determined by the difference between the sum of water intake and endogenous water production and the sum of losses. Several questionnaires have been developed to evaluate water intake through food and drinks. However, assessing water losses through different routes of elimination is more complicated. Thus, few questionnaires evaluate intake and loss of water at the same time.

Objective: This study aims to develop a hydration questionnaire which can accurately determine the hydration status in the university population.

Method: The questionnaire development process included 3 steps: (1) identifying all foods and beverages from Spanish food composition tables which have water content higher than 80% (w/w); (2) recognizing the drugs and pathologies that may compromise hydration status as well as important hydration habits such as daily fluid consumption; (3) compiling all items and developing the hydration questionnaire.

Results: The final version of the hydration questionnaire comprises 24 items about hydration habits, relevant pathologies and questions related to regular fluid elimination (urination/defecation). In addition, it includes a brief food frequency questionnaire of the main water diet contributors.

Conclusions: We have designed a comprehensive, short and simple screening tool to assess the population’s hydration status.

Key words: hydration, water balance, questionnaire.

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Key words: children, fluids, parents, educational level.

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Background: Data about hydration status in children and psychological aspects are scarce.

Objective: To analyze the relationship between diuresis and urine osmolarity and indicators of stress, mood, and attention in a group of Spanish schoolchildren.

Method: 278 children (aged 7-11 years) from different Spanish provinces participated in a cross-sectional study. Single 24-h urine samples were collected and urine osmolarity was calculated. IECI, CDI and “d2” tests were applied in order to assess stress, mood and attention, respectively. Sample was divided regarding urine osmolarity in children with high urine osmolarity (HO) (>800 mOsm/L) and with low urine osmolarity (LO). Statistical analyses were performed with SPSS v.20.

Results: Finally 129 boys and 120 girls provided complete urinary and psychological data. In boys there were no differences in psychological scores between HO and LO but significant positive correlations were found between diuresis and attention (r=0.2262, p<0.01) and concentration scores (r=0.2512, p<0.01).

In females, stress scores in health domain (IECI-Health scores) and Global stress were significantly higher in HO than in LO. Also osmolarity positively correlated with IECI-Health scores (rho-Spearman=0.2236, p<0.05) and Global stress scores (rho-Spearman =0.2015, p<0.05), while inverse correlations were found between diuresis and IECI-School (rho-Spearman =-0.2130, p<0.05), Global stress (rho-Spearman =-0.2215, p<0.05) and CDI-Depression scores (rho-Spearman =-0.1879, p<0.05).

Conclusion: In this study, a better hydration status is related to better selective attention and mental concentration scores in boys, and lower stress and better mood in girls.

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Key words: hydration, stress, mood, attention, schoolchildren.

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