

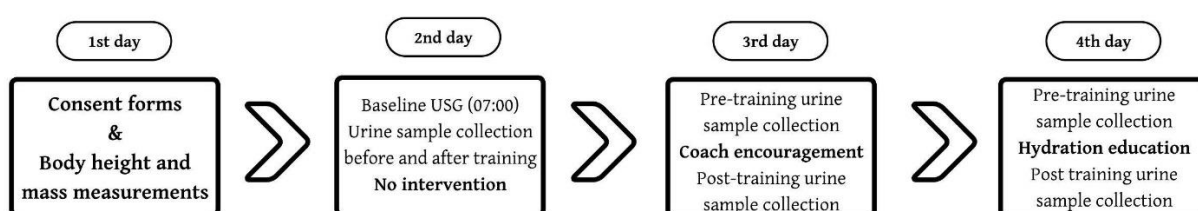
Official Title: The Impact of Brief One-time Education and Coach Encouragement on Hydration Status in Child Judo Athletes

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Study Design

This within-subject experimental study examined the effects of coach encouragement and a brief one-time educational intervention (hereinafter referred to as education) on the hydration status of child judo athletes, compared to a no-intervention control, during a four-day training camp. As a within-subject design was adopted, each participant underwent all experimental conditions across different days. Athletes were unaware of the intervention conditions assigned to each day, and the educational session was presented without emphasizing its experimental nature. The order of conditions was fixed (control first, then coach encouragement, and finally education) to minimize potential carryover effects. The researcher conducting the hydration assessments was not blinded. Athletes and their legal guardians were informed about the nature of the study, and written consent was obtained from both parties. The study was conducted over four consecutive days. On the first day, anthropometric measurements were recorded. On the second, third, and fourth days, athletes' hydration status was assessed before and after training sessions under three different conditions: no intervention, coach encouragement, and educational intervention.



The same training program was applied across all three experimental days. A detailed description of the sessions is presented in Table 1. All training sessions were conducted between 10:00 and 12:00 under consistent environmental conditions (temperature, humidity) throughout the experimental period.

Table 1. Judo training programme for child athletes during the experimental period

Content	Duration (min)
Warm-up	20
" <i>Uchikomi</i> " (Technique repetition; standing, different directions, etc.)	20
<i>Ne-waza</i> workout (groundwork techniques)	20
3 × 4 min " <i>Ne-waza randori</i> " (groundwork battle)	11
6 × 4 min " <i>Tachi-waza Randori</i> "	34
Cool-down	15
Total	120

Note: The same training program was applied across all three intervention days (Day 1, Day 2, and Day 3).

Statistical Analysis

All data analyses were performed using JASP (version 0.19.0) and IBM SPSS Statistics (version 20.0). Descriptive statistics—such as means, standard deviations, and 95% confidence intervals—were calculated for participants' physical characteristics and variables related to the first morning urine samples. Normality was assessed by examining the Shapiro–Wilk test results and evaluating skewness and kurtosis values, with thresholds of ± 2 being considered acceptable. Changes in USG across the three experimental conditions (i) no fluid intake guidance during training, (ii) fluid intake encouraged by the coach, and (iii) pre-training hydration education—were analyzed using a two-way repeated measures ANOVA (2 [time: pre- vs post-training] × 3 [experimental conditions]). Sphericity was evaluated with Mauchly's test, and where violations occurred, the Greenhouse–Geisser correction was applied to adjust for the degrees of freedom. In cases where significant main or interaction effects were detected, post hoc comparisons were conducted using Holm's adjustment for multiple testing. To determine whether hydration status (classified as hydrated or hypohydrated based on USG thresholds) changed significantly from pre- to post-training, McNemar's test for paired nominal data was subsequently employed, and exact p-values were computed using the exact binomial test. Given the ordinal scale of urine color (UC) scores, changes from pre- to post-training were assessed using the non-parametric Friedman test. When significant differences were observed, Conover's post hoc test with appropriate correction for multiple comparisons was applied. The

significance level was set at $p < 0.05$. Effect sizes were reported as Cohen's d for post hoc comparisons, eta squared (η^2) for ANOVA, and Kendall's W for the Friedman test.