

Supplementary Table 2. Sensitivity analyses for the effects of cold-water immersion on recovery outcomes

Panel A. Exclusion of the 20 °C study (DOMS)

Analysis	k	SMD [95% CI]	p	I ²
Primary (all studies)	47	-0.81 [-1.10, -0.52]	<0.001	73.3%
Excluding 20 °C study	46	-0.81 [-1.12, -0.51]	<0.001	76.9%
≈15 °C subgroup, primary	16	-0.90 [-1.30, -0.40]	<0.001	68.8%
≈15 °C subgroup, excl. 20 °C	15	-0.88 [-1.37, -0.39]	<0.001	74.3%

Panel B. Within-person correlation (crossover studies)

Outcome	Independent (primary, RE)	Paired, r = 0.5	Paired, r = 0.7
DOMS	-0.82 [-1.11, -0.52]	-0.82 [-1.11, -0.52]	-0.83 [-1.14, -0.52]
CK	-0.64 [-0.92, -0.36]	-0.64 [-0.92, -0.36]	-0.66 [-0.96, -0.37]
Mb	-0.93 [-1.46, -0.40]	-0.93 [-1.46, -0.40]	-0.95 [-1.50, -0.39]

Panel C. Exclusion of high-risk-of-bias studies

Outcome	Analysis	k	SMD [95% CI]	p	I ²
DOMS	Primary	47	-0.81 [-1.10, -0.52]	<0.001	73.3%
	Excl. high-RoB	45	-0.80 [-1.10, -0.50]	<0.001	76.6%
CK	Primary	34	-0.64 [-0.90, -0.30]	<0.001	67.0%
	Excl. high-RoB	32	-0.63 [-0.93, -0.34]	<0.001	71.6%
Mb	Primary	7	-0.93 [-1.40, -0.40]	<0.001	57.3%
	Excl. high-RoB	6	-0.97 [-1.62, -0.32]	<0.001	68.0%

Panel D. Leave-one-out: exclusion of Vieira et al. (2016) from the ≈5 °C DOMS subgroup

Analysis	k	SMD [95% CI]	p	I ²
≈5 °C subgroup, primary (with Vieira 2016)	3	-0.18 [-2.07, 1.71]	0.85	92.7%
≈5 °C subgroup, excl. Vieira et al. (2016)	2	-1.15 [-1.81, -0.49]	<0.001	0.0%

Panel E. Trim-and-fill and leave-one-out influence analysis (DOMS and CK)

Outcome	Analysis	k	SMD [95% CI]	p	I ²
DOMS	Observed (unadjusted)	47	-0.82 [-1.12, -0.51]	<0.001	76.6%
	Trim-and-fill adjusted (k0 = 0)	47	-0.82 [-1.12, -0.51]	<0.001	76.6%
CK	Observed (unadjusted)	34	-0.64 [-0.93, -0.35]	<0.001	70.9%
	Trim-and-fill adjusted (k0 = 2)	36	-0.72 [-1.01, -0.42]	<0.001	73.4%

Values are standardized mean differences (SMD; Hedges' g) with 95% confidence intervals (CI), estimated using a random-effects model (REML) as the primary analysis. DOMS, delayed-onset muscle soreness; CK, creatine kinase; Mb, myoglobin; RoB, risk of bias. Panel A: White et al. (2014) was the only included study using 20 °C water. Panel B: studies employing a within-participant (crossover) design were re-analyzed using paired-data variances under assumed within-person correlations of $r = 0.5$ and $r = 0.7$; the independent-groups estimate and the $r = 0.5$ estimate coincide by construction. Panel C: studies rated at high overall risk of bias were Fonseca et al. (2016) and Stearns et al. (2018). Panel D: the ≈5 °C DOMS subgroup showed substantial heterogeneity ($I^2 = 92.7\%$) driven by Vieira et al. (2016), which reported an effect in the opposite direction; excluding this study yielded a homogeneous estimate ($I^2 = 0.0\%$) based on only two studies. The between-subgroup test for DOMS temperature categories remained non-significant regardless of this study's inclusion ($p = 0.79$ with, $p = 0.73$ without). Trim-and-fill (Duval & Tweedie, 2000) and leave-one-out influence analyses were additionally conducted for DOMS and CK to further evaluate publication bias and the influence of individual studies (Panel E). No missing studies were identified for DOMS. For CK, two potentially missing studies were estimated on the side of smaller-magnitude effects; the trim-and-fill-adjusted estimate was slightly larger in magnitude than the observed estimate, indicating the finding is unlikely to reflect conventional publication bias. Leave-one-out analysis showed no single study exerted a

disproportionate influence on the pooled estimate for either outcome (maximum shift in SMD: DOMS, 0.06; CK, 0.07).