

-Achievements, Legacy and Continuity 2020-

Effect of Pre-race Medicine Ball Throw Down on Fifty-metre Front Crawl Performance

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Introduction

- It is widely accepted that having warm-up prior to a race event is essential to enhance swimming performance.
- Various methods have been utilised to maintain the effects of warm up until the race start in swimming competitions. In addition to those strategies, it is getting common for top-level swimmers to perform the medicine ball throw down sets (MBTD), consisting of an exercise of throwing a medicine ball downward forcefully onto the ground prior to the race event in swimming.

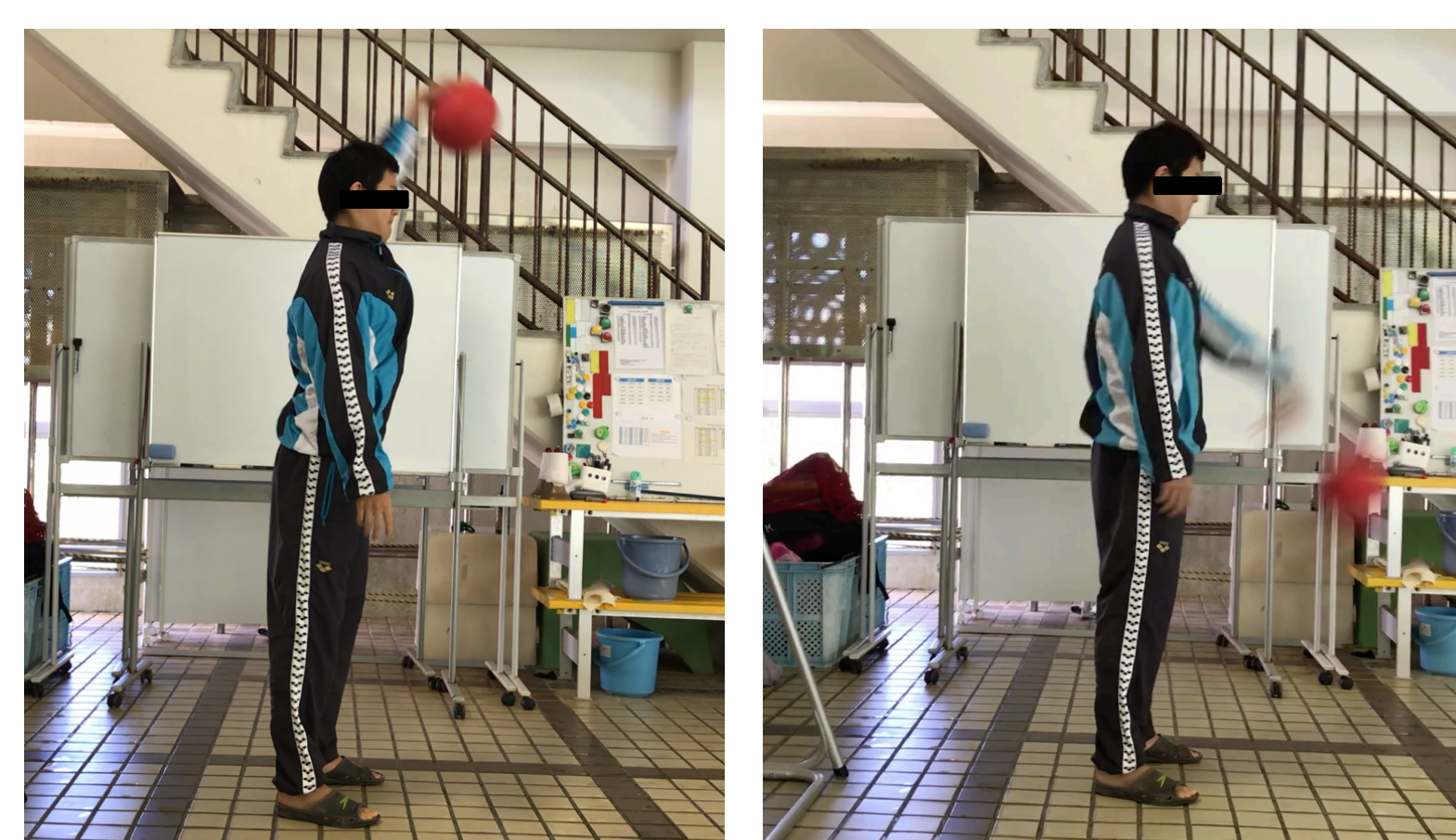


Figure 1. MBTD

- As the upper limbs contribute 70 - 90 % of the propulsive force (Adrian et al., 1965; Bucher, 1975; Deschodt et al., 1999; Hollander, 1987; Holmer, 1974; Kamata, 1995), force generated from upper limbs is essential for acquiring propulsive force. Moreover, a study on the relationship between swimming speed and upper limb power in both 50m and 400 m freestyle has proved that there is a significant correlation between 50m freestyle and muscular power (Hawley et al. 1992). Thus, exerting high muscular strength could be essential especially in 50m events.
- However, MBTD effectiveness remains controversial. The purpose of this study was to investigate the effect of completing the MBTD on 50m front crawl performance.

Methodology

- 8 national level male swimmers with 21.5 ± 1.5 years of age (personal best 50m freestyle time of 24.14 ± 1.07 secs) participated in this study.
- In a randomised crossover manner, swimmers underwent a standard pre-race procedure (CON condition) and a standard pre-race procedure including the MBTD sets (MBTD condition).

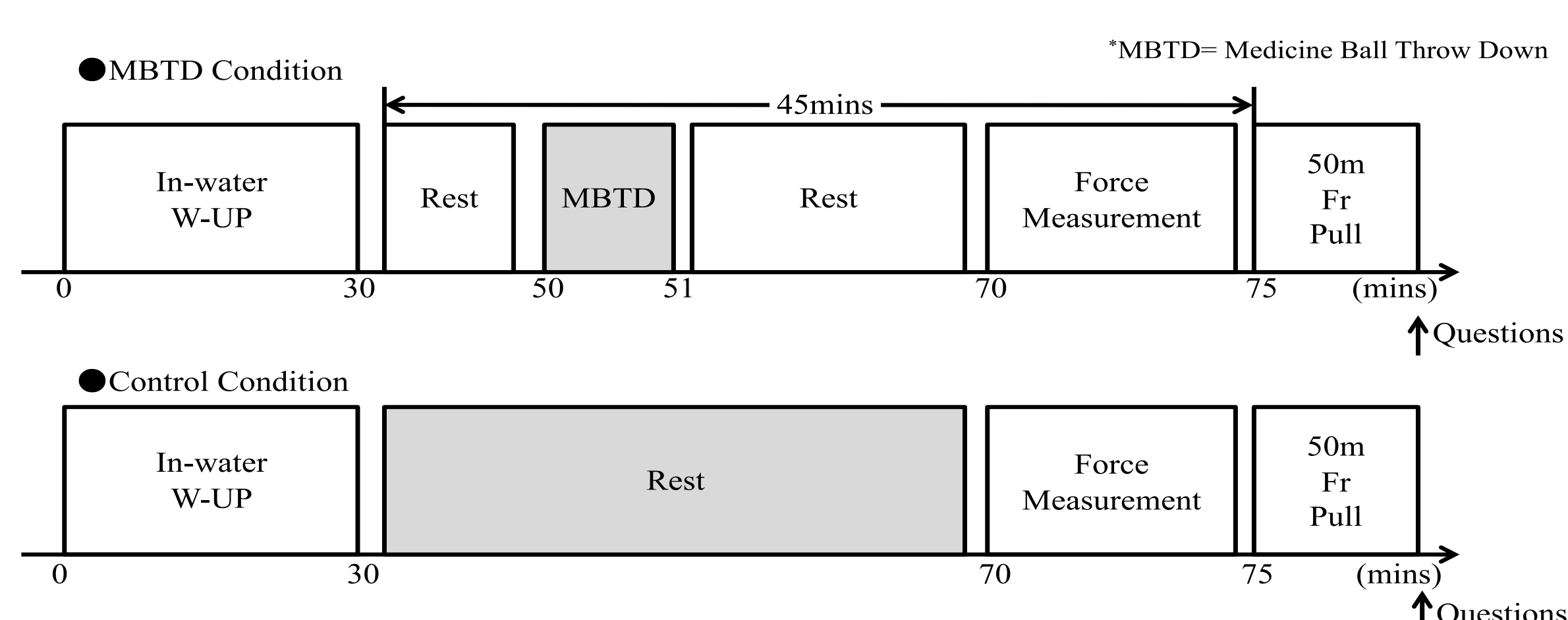


Figure 2.. The Experimental Protocol

- Swimmers performed a 50m all-out front crawl pull time trial after each condition. Force measurement and subjective sensation were quantified before and after the time-trial, respectively. The questions for subjective sensation were as follows; (1) In comparison to in-water W-UP, was it easier to swim? (2) In comparison to in-water W-UP, did you feel you caught more water? (3) In comparison to in-water W-UP, was it easier to exert the force?



Figure 3. Force Measurement

Results

- 7 out of 8 swimmers swam faster under the MBTD condition with a significant tendency between each condition ($p = 0.78$).
- There was no significant difference in the maximum and average force values between the conditions.
- Regarding subjective sensation, significant difference was demonstrated between 2 conditions ($p = 0.006, 0.033$ and 0.007).

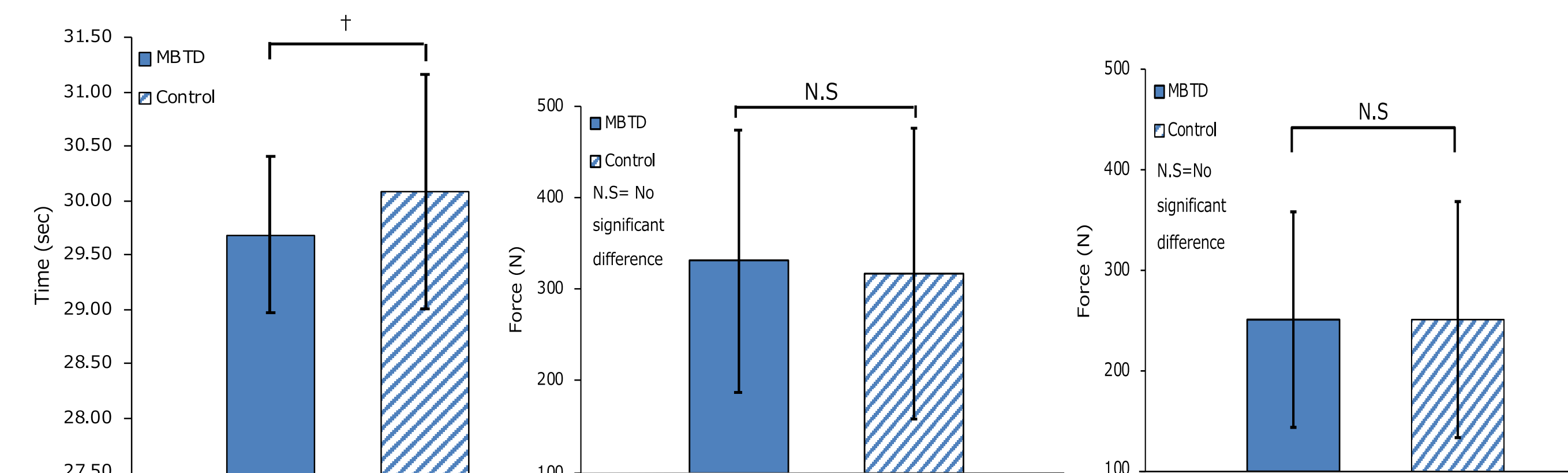


Figure 4. Mean and SD for 50m Time, Maximal Force and Average Force from the two conditions, respectively

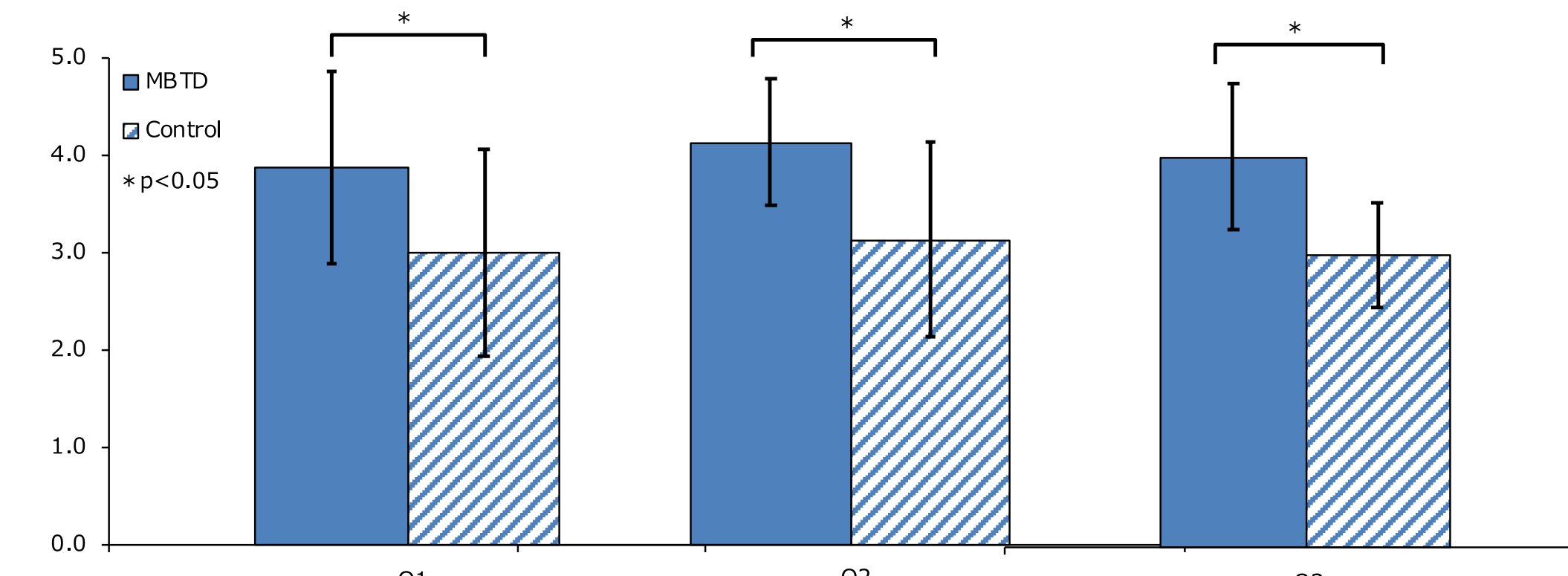


Figure 5. Mean and SD for Subjective Sensation from the two Conditions

Conclusion

- A 50m front crawl pull time tended to improve under the MBTD condition compared to the CON condition.
- Subjective sensation increased meaningfully in the MBTD condition. From these findings, it is considered that performing the MBTD before the sprint race is effective in improving subjective sensation resulting in higher swimming performance.
- Further consideration will be needed to yield other findings about the effect of the MBTD and to obtain new knowledge regarding pre-race strategies.