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The relationship between breaths taken and swimming performance in a 50-meter freestyle race

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## INTRODUCTION:

The 50m freestyle race is the event with the highest speed in the competitive swimming. To achieve a high swimming speed, the following are important, (1) increase propulsion and (2) minimize resistance (Toussaint & Beek, 1992). The front crawl stroke used in racing is considered to cause an increase in resistance and a reduction in propulsion, as the posture changes significantly due to respiratory movements (Pedersen et al., 2006). Further, it has been shown that it is necessary to reduce the number of breaths to as few as possible to avoid increasing the resistance in the 50m freestyle races (Pedersen et al., 2006). However, how many breaths should be taken during a 50m freestyle race was not indicated. The purpose of this study was to examine the relationship between the number of breaths during a race and the swimming performance results in a 50m freestyle event.

## **METHODS:**

228 swimmers (121 males, 107 females) who participated in the 50m freestyle event at the Inter college swimming championship 2018 in Japan were analyzed. The competition was carried out at a long course (50m). Each race in the heats and B-final, and the final competition was video-recorded, and the number of breaths of the subjects was counted from the obtained movie. The swimming speed was calculated from the competition results and used as the swimming performance. **RESULTS:** 

In the 50m freestyle races, the most frequently observed number of breaths was once (44.2%) in males and three times (32.0%) in females. The average number of breaths was 1.3 times for males and 3.0 times for females in the heat and was 0.3 times for males and 1.8 times for females in the finals. There was a significant difference between the heat and the finals in the number of breaths for both males and females (P<0.05). The swimming speed at each the number of breaths for males and females, respectively, was 2.147 m/s and 1.921 m/s in 0 time, 2.108 m/s and 1.882 m/s in 1 time, 2.085m/s and 1.878 m/s in 2 times, 2.058 m/s and 1.846 m/s, in 3 times, 2.046 m/s and 1.821 m/s in 4 times, and 2.177 m/s and 1.818 m/s in 5 times. In addition, for females, it was 1.818 m/s in 6 times and 1.778 m/s in 8 times. A significant difference was observed in the swimming speed at each the number of breaths (P<0.05). There was a significant correlation between the number of breaths and the swimming speed in male and female (P<0.05)

## CONCLUSION:

Previous studies have reported that eight male 50m freestyle finalists in the national championships breathed 1, 2 or 3 times (Pedersen et al., 2006). In this study, the results showed that the lower the number of breaths, the higher the swimming speed. Reducing the number of breaths was considered a prerequisite for success in the 50m freestyle races. Therefore, it was suggested that it is preferable for coaches to instruct swimmers to suppress breathing to 0 or 1 time for males and 2 times or less for females.

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