Effects of Static Stretching on Swimming Sprint Performance

Paul House and Maggie Farley
Oklahoma Christian University, Edmond, OK

ABSTRACT

Purpose: The purpose of this study was to determine if there is a difference in 50-meter freestyle swimming performance under two conditions: static stretching (SS) and no stretching (NS), (1,2,3). **Methods:** Thirteen adults (7 males and 6 females) ages 20.77 ± 2.28 years performed 50-meter freestyle swimming sprints both post static stretching (SS) and no stretching (NS). The SS and NS swim trials were completed at least 3 days apart and in randomized order. Under the SS condition, subjects completed five different stretches (including both upper and lower body) for two sets holding each stretch for 40 seconds. Under both conditions, a standardized swim warm-up was preformed prior to the trial. Fifty-meter swimming trials were completed in a 25-meter pool consisting of one trip down, a turn-around, and one trip back. Stopwatches were used to time each trial. A paired t-test was the statistical method used to analyze group mean differences.
Results: The mean swim times were 26.91 ± 2.21 and 26.97 ± 2.31 seconds for the SS and NS conditions respectively. There was not a significant difference between the two conditions t(12) = 2.17; p = 0.58.
Conclusion: These results indicate that static stretching prior to a 50-meter swim performance does not appear to influence the outcome compared to no stretching. Perhaps differences between conditions would appear if a larger static stretching volume (number of sets or duration) were employed, or a greater sampling size. Of further interest would be the aforementioned effects on longer swim trials e.g. 100-meters. Finally, the use of a subjective scale to measure stretching intensity might provide further insight.

INTRODUCTION

The focus of this study was on 50-meter freestyle swimming times following NS and SS conditions. Under SS condition, some research has indicated an increase in swim times (1), conversely, others show an improvement in swim performance when compared to other stretching modalities (2). Finally, other researchers have reported no difference between SS and NS (3, 4). These discrepancies could be due to varying intensities and volume of stretches. Other factors could include differences in: muscle groups stretched, swimming strokes performed, and swim distances. Of specific interest in this study was the combined effects of upper and lower body static stretches prior to a 50-meter freestyle swimming sprint.

METHODOLOGY

This study consisted of 13 subjects (7 males, 6 females). The subjects were healthy college age (20.77 ± 2.28 years) collegiate swimmers. There were two testing sessions. During the first session, the subjects were randomly placed into a SS or NS group. Both groups performed a standard swimming warm-up followed by either five static stretches or no-stretching. Following the stretching, subjects performed a 25-meter freestyle sprint down one end of the pool, performed a turn-around, and sprinted back for a total of 50-meters. For the second testing session, the same protocol was completed but group assignments were reversed. The five stretches completed were: triceps brachii, shoulder internal and external rotator cuff, hip flexors (static lunge position), and hip adductors (butterfly) stretches. Each of the five stretchers were held for 2 sets of 40 seconds. For statistical analysis, a paired t-test was used to determine if there were mean group differences in the two swim trial conditions (SS and NS). To decrease the chance for committing a type II error, the α was set at 0.05. The independent variable was the stretching conditions (SS and NS), while the dependent variable was the 50-meter swimming sprint times.

RESULTS

The mean swim times were 26.91 ± 2.21 and 26.97 ± 2.31 seconds for the SS and NS conditions respectively. There was not a significant difference between the two conditions t(12) = 2.17; p = 0.58. The SS mean swim time was 0.06 seconds faster than the NS. See table 1 below for descriptive statistics.

Table 1
Descriptive Statistics

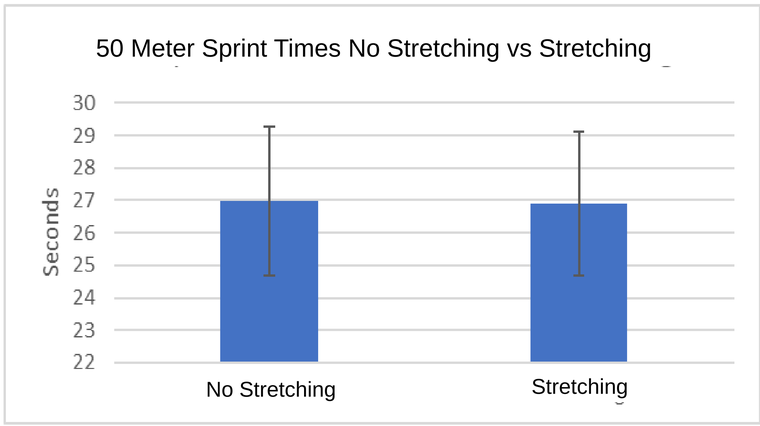
	N	*Minimum*	*Maximum*	*Mean*	*Std. Deviation*
Body Weight (pounds)	13			167.85	24.46
Height (inches)	13			70.54	3.28
Age (years)	22	65	235	20.77	2.28

See table 2 below for the mean swim sprint times, ± 1 standard deviation, under both conditions, as well as the t static with p value

Table 2
Paired t-test Statistics with Means and Standard Deviations

	Min	*Max*	*Mean*	*Std. Deviation*	*t static(DF)* *Critical two-tailed*	*p value*
***NS** - Mean Sprint Time (seconds)*			26.91	2.31	2.18(12)	0.58
***SS** - Mean Sprint Time (seconds)*			26.97	2.21		
Age (years)			20.77	2.28		

For a graphic depiction of the means and standard deviations for the two swim sprint times conditions, see figure 1 below.



**denotes p value ≤0.05*

CONCLUSION

These results indicate that static stretching prior to a 50-meter swim performance does not appear to influence the outcome compared to no stretching. Perhaps differences between conditions would appear if a larger static stretching volume (number of sets or duration) were employed, or a greater sampling size. Of further interest would be the aforementioned effects on longer swim trials e.g. 100-meters. Finally, the use of a subjective scale to measure stretching intensity might provide further insight.

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