

# [Effects of caffeine on repeated freestyle sprints in elite male swimmers](https://assignbuster.com/effects-of-caffeine-on-repeated-freestyle-sprints-in-elite-male-swimmers/)

Clinical Trial — CONSORT evaluation

## Title and Abstract

CONSORT item 1a (Schulz, Altman, &Mohar, 2010) identifies that, caffeine ingestion improves repeated freestyle sprints in elite male swimmers were non-randomised controlled trials (RCTs) (Goods, Landers and Fulton, 2017).

The Abstract complies with CONSORT item 1b. The structured summary of trial design is single-blinded and crossover study to verify the sufficiency of caffeine and placebo to improve repeated-sprint performance in exclusive freestyle sprinters. In terms of duration, the trial conducted for three weeks. Participants were allocated into treatment groups via simple randomisation in which warmup, experimental protocol, blood sampling and sprint times were included.  This data is useful for EBPs when analysing the study. The results indicate that valuable improvement to sprint time was found of each sprint in the caffeine trial. It concluded that the combination of the moderate dose of caffeine with trained athletes is most likely to enhance repeated sprint ability. However, the ability of caffeine ingested to the athletes to improve performance remains unclear.

Introduction

CONSORT item 2a is about scientific background, which is described quite well in this article. Caffeine is a popular ergogenic aid among athletes to investigate its effects on swimming performance. A study found an improvement seen in free-style sprint performance of trained participants by using 250mg of caffeine. Nevertheless, due to lack of information about caffeine ability to improve sprint or performance, it is difficult to determine the efficacy of moderate dose caffeine to improve free style performance.

In the current study it was hypothesised that adequate dose of caffeine would lead to beneficial improvement in the first and mean sprint all through the 6 x 75m repeated sprint trial which conforms to the CONSORT item 2b.

## Methods

## CONSORT item 3a somehow related to this study. This was a 3-week, single-blind, cross-over study of nine highly trained male swimmers to assess the improvement in 6 x 75m freestyle performance from caffeine ingestion in Australia.

## According to CONSORT item 4a the eligible participants were all male highly trained swimmers aged 20. 8 ± 2. 8 y; body mass 83. 9 ± 6. 4 kg who met the eligibility criteria for the consent to participate and complete a pre-participation health history form approved.

The CONSORT item 5 is in the article. Firstly, participants were allocated into treatment groups before their first session through simple randomisation and then all participants completed standardised warm up before testing session. For each trail, sprints were started by researcher and simultaneously a waterproof heart rate bar was placed on participants’ chest to check heart rates in each trial.

Item 6a partly found in this article. The primary outcomes with respect to efficacy of caffeine was the participants’ performance improved after the ingestion of moderate dose of caffeine but the exact mechanism for an improved repeated-sprint ability following proper caffeine ingestion remain unknown.

There are no changes seen to the trial outcomes after it commenced, which means item 6b is not clear in the article.

The CONSORT item 7a is partly answered in the article. There were nine highly trained swimmers selected for the trial. Moreover, it was stated that participants were enlisted, and characteristics were listed in the trial. Whereas, there is no information about how participants were chosen. EBPs should use a sample size to avoid bias and increase the chances of producing relevant data.

Participants were allocated into treatment groups prior to their first session via simple randomisation that is 1: 1 allocation that shows item 8b in the article.

Item 9 is in the article. Each week, substrate tablets were ground up and body weight corrected doses were deposited into white gelatine capsules. Participants consumed same number of capsules in trials.

Item 10 is not answered in the article as there is no information about who generated allocation sequence or who assigned participants.

The outcomes assessors, coaches and data analysts were kept blinded to the allocation in the trial which is CONSORT item 11a.

The CONSORT item 12a is described a hazard ratio which compares the probability of event in statistical analysis. The analysis found smallest worthwhile change in performance was deemed to be standard deviation (SD) 0. 2 among SD participants across all sprints in the placebo trial.

Item 12b about the methods for additional analysis like subgroup analyses and adjusted analysis. Nevertheless, in the trial there was no information about additional analysis.

## Results

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| The article has no participant flow diagram. Therefore, it does not conform with CONSORT item13. An item 13a is somewhat met. The number of participants were randomly assigned in trial either for caffeine or placebo, but it is not clear in the article. However, the trial analysed the primary outcomes of placebo or caffeine in swimmers in Table 1, by giving relevant data for each sprint, placebo or caffeine and effect size. The given information demonstrates that worthwhile improvement to sprint time occurred in each caffeine trial.  CONSORT item 14 is not mentioned in the article. There was no relevant evidence in the trial about the elimination of participants and why trial was ended or stopped.  There was no table in the article showing baseline demographic data and clinical characteristics of each group.  That is why, it does not adhere to CONSORT item 15.  CONSORT item 16 somehow met with this article as the primary analysis was done to improve performance and involved all participants who were randomly assigned but it was not stated whether all participants were involved in each trial or not.  For item 17, there is some binary outcomes like the moderate caffeine ingestion improved performance by 1. 3%. While there was only a large effect for improvement seen for 3 rd and 4 th sprint that was 2. 5% and 2. 1%.  The harms and unintended effects in each group of trial meets the requirement of CONSORT item 19. The article stated that heart rate increased throughout the trial. Five participants correctly guessed the order in which they ingested each substrate, but three participants reported that caffeine may have affected their sleep that night, with one missing the next morning’s training session. |

## Discussion

The article conforms to CONSORT item 20. It describes the pros and cons of the study and its results, imprecision and considering other relevant evidences. There was a lack of information on sources of bias for this trial. Another research limitation of this trial was an insufficient dose of caffeine. Imprecision of the trial was the moderate dose of caffeine ingestion which improved mean sprint time during 6 x 75m freestyle repeated sprint convention performed by best swimmers, nonetheless, just a substantial impact for development was recorded for the third and fourth sprint.

As the intervention is implemented for highly trained male swimmers, different age groups to improve performance, the results indicate that worthwhile improvement was found for each of the first 5 sprints of caffeine ingestion. Explicit mention of external validity is not given, even if that is what authors discussed in the article. So, CONSORT item 21 partly answered in the article.

Item 22 partly complied with article. There was no large effect seen in the athletes’ performance in prior surveys but after 3 rd and 4 th sprint the performance improved by 1. 3% following moderate dose of caffeine ingestion.

Full details of the trial protocol can be found with full text atwww. jssm. org. This conforms CONSORT item24.

Ethical approval for the trial was granted by Human Ethics Committee of the University of Western Australia and blood sampling equipment used in the trial from Radiometer Medical A/S, Copenhagen, Denmark. This describes item 25.

## References

* Goods, P. S. R., Landers, G., & Fulton, S. (2017). Caffeine ingestion improves
* repeated freestyle sprints in elite male swimmers. Journal of Sports Science and
* Medicine. 16 (1), 93-98.
* Schulz, K. F., Altman, D. G., & Moher, D. for the CONSORT Group. (2010). CONSORT 2010 Statement: Updated guidelines for reporting parallel group randomised trials. BMJ, 340, c332. doi: 10. 1136/bmj. c332