

Generic Assessment Criteria	Mark s availa ble
1. Engagement with Literature Skills	
	25
2. Knowledge and Understanding Skills	
	25
3. Cognitive and Intellectual Skills	
	30
4. Practical Application Skills	
	10
5. Transferable Skills for Life and Professional Practice	
	10

Assessment Mark (Assessment marks are subject to ratification at the Exam Board. These comments and marks are to give feedback on module work and are for guidance only until they are confirmed.)	Late Submission Penalties (tick if appropriate)	
	Up to 1 week late (40% Max)	
	Over 1 week late (0%)	

Project Proposal

UNIVERSITY OF WALES TRINITY SAINT DAVID
Independent Project (BMSS6007)

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Effects of caffeine supplementation on exercise performance via 30s Wingate Test

Research Question

Can caffeine supplementation prior to exercise can have an impact on exercise performance? The main object of this study is to look at caffeine supplementation before exercise and its effects on physical performance. The idea is to investigate if there will be any benefits of physical performance obtained by caffeine supplementation. In order to find an answer to this question a case study will be carried out. This study will consist of 10 participants to take part in a Wingate test. Wingate test will measure participants' physical performance output. The test will be done several times. By looking at participants' results the Wingate test will give us precise information about their performance levels with and without the caffeine supplementation.

Introduction

Caffeine, also known as trimethylxanthine in which the three methyl groups are placed at areas 1,3, and 7 is a substance that naturally occurs in beverages like tea and coffee (A.P.A, 2020). Caffeine is a substance that can result in many physiological changes in the body which may assist in physical performance. Consumption of caffeine can result in increased energy availability, increase cognitive performance, reduces mental tiredness, improved focus, attention, and concentration, develop memory, and results in solving problems that demand reasoning in an easier way (Grgic, 2018, pp. 219-225). Apart from all these effects stated above, caffeine is mostly known in the literature for its ergogenic impacts on sports and exercise performance. The impacts of caffeine intake and supplementation on enhancing aerobic performance are well known (Berglund and Hemmingsson, 1982, pp. 234-236, Bruce et al, 2000, pp. 1958-1963). Furthermore, there is significant data that reveals the positive effects of caffeine supplementation on anaerobic performance as well (Astorino and Roberson, 2010, pp. 27-265, Davis and Green, 2009, pp. 1029-1036, Grgic and Mikulic, 2017, pp. 1029-1036). A well-established test for measuring anaerobic capacity and power output is the Wingate test. The Wingate test follows an easy method to obtain all that data from the participants who are taking the test. The test usually requires a short warm-up and then follows with pedalling at a maximum speed for 30 seconds. The Wingate test is a very popular and well-approved method to gather data on physical performance in an inexpensive way (Bar-Or, 1987, pp. 381-394). Few studies investigated the impacts of caffeine consumption on Wingate test results and they

ended up with unclear results. A Wingate study done by Greer, Morales, and Coles in 2006 did not find any important impacts of caffeine consumption on physical performance (Greer et al, 2006, pp. 597-603). On the other hand, Salinero et al. in 2017 revealed that in a group of young men and women caffeine intake showed a significant enhancement in mean power and peak power output in a Wingate test (Salinero et al, 2017, pp. 269). This study will demonstrate the effects of caffeine intake on physical performance by using 30 second Wingate test on 10 participants which consist of men and women and give information about their physical performance data such as their peak power and mean power output and compare the results with and without caffeine consumption before the test. This method will show if there is a positive correlation between caffeine and exercise performance.

Aims

The main aim of this study is to find if there is a link between caffeine and exercise performance. In order to achieve sufficient data 10 participants will take part in this study. Another aim is to look at the data on exercise performance obtained from the Wingate test and analyze it to see the effects of caffeine on peak and mean power outputs. The study will also show the placebo effect on participants. In the literature, the placebo effect showed that it can result in physical and mental positive outcomes. One study looked at the placebo effects of caffeine supplementation in well-trained cyclists and showed that it directly or indirectly increases physical performance (Beedie et al, 2006, p. 2159). To show the significance value of the test with the SPSS (IBM Statistical Package for the Social Sciences Statistics 26) program by analyzing the data collected from the Wingate test.

Methodology

The study implements a crossover design. The caffeine supplementation will be supplied by the UWTSD setting and the Wingate testing will always be under the observation of the UWTSD staff members. The supplementation will be in powdered form and the test will be a 30-second Wingate test to measure their exercise performance. All the ethical guidelines of UWTSD will be followed. All participants will voluntarily take part in this study and they will be informed about the storage method of all the data obtained from them for the test and how it will be used. Consumption of coffee is ignored because the exact amount of caffeine might be affected and different because of the other compounds that are in the coffee (Graham et al, 1998, pp. 883-889). The study will only look at the effects of caffeine and other substances such as taurine will not be combined and consumed with the caffeine. To collect sufficient data for the study 10 participants will take part. The participants will consist of both sex group which is men

and women and, they are all healthy adults. Each participant will need to do the test 3 times in order to get the best data for the study. The first test is just for participants to learn what the Wingate test is and how it works. The other two tests will be with caffeine supplementation and one of those tests will be the placebo effect of caffeine. The participants and even the researcher will not know if the drinks contain caffeine. The test will be done in UWTSD Sports Lab and the staff will be responsible for giving participants caffeine supplements and observing the test to meet all the ethical guidelines. These tests will be done with at least 48 hours of break in between for the participants to recover and perform at their best. All the data will be collected via the Wingate test and stored safely by meeting all the rules of the UWTSD. The data only will be shared with the lecturer and the staff who is responsible for this research.

Data Analysis

The collection of the data from the participants will be done with the Wingate test. The collected data will be placed into the SPSS Programme (IBM Statistical Package for the Social Sciences Statistics 26). An independent T-test will be carried out to analyze data. For research to be significant the p-value needs to be lower than 0.05.

Research Timetable

The research proposal will be written by the 28th of October 2022.
The participants will do the Wingate test and all the information for the research will be collected by the 15th of December 2022.
The dissertation will be finished by the 28th of April 2023.
The abstract and the whole research will be finished by the 5th of May 2023.

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