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Kampus Sultan Abdul Jalil Shah



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THE EFFECT OF CAFFEINE ON
RECOVERY IN SPRINTERS
UNIVERSITI PENDIDIKAN
SULTAN IDRIS



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THESIS REPRESENTED TO QUALIFY FOR BACHELOR OF SPORT
SCIENCE (COACHING SCIENCE) WITH HONOUR

FACULTY OF SPORT SCIENCE AND COACHING
UNIVERSITI PENDIDIKAN SULTAN IDRIS

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DECLARATION OF AUTHENTIC WRITING

I hereby declare that thesis entitled The Effect of Caffeine on Recovery in Sprinters Universiti Pendidikan Sultan Idris is based on my original work except for citations which have been duly acknowledged. I also declare that it has not been previously submitted for any other degree or award at Universiti Pendidikan Sultan Idris.

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APPROVAL FOR SUBMISSION

This thesis entitled The Effect of Caffeine on Recovery in Sprinters Universiti Pendidikan Sultan Idris prepared by Khairun Hanisah binti Kamarudin was certified to meet the required standard for submission in partial fulfilment of the requirements for the award of Bachelor of Sport Science (Coaching Science) with honour at Universiti Pendidikan Sultan Idris.



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THE EFFECT OF CAFFEINE ON RECOVERY IN SPRINTERS UNIVERSITI PENDIDIKAN SULTAN IDRIS

ABSTRACT

Research on the effect of caffeine is widening all over the world and caffeine is most likely known as an ergogenic aid in enhancing sports performance and recovery faster. The purpose of this study is to identify the effect of caffeine on recovery heart rate in UPSI Sprinters. Individual heart rate produced may vary at different time of the day and their food intake. 10 male sprinter athletes (n=10) from Fox Athletics Club of Universiti Pendidikan Sultan Idris had participated in this study. Participants were divided into two groups, caffeine group (n=5) and control group (n=5) accordingly. Training sessions were conducted with one week interval and sprint training were performed by the sprinters as the exercise load method. Control group was not given any caffeine (0.00 mg/kg) while the caffeine group was given 3.00-3.50 mg/kg of caffeine dosage before the training session begun. The sprint training involved sprinting in distance set of 10m, 30m, 50m, 80m and 100m with 5 minutes rest interval between sets and ended with cooling down. Multiple heart rate recovery (HRR) recorded according to the time trend 1st min, 5th min, 10th min, 20th min, 30th min, 40th min, 50th min and 60th min 5 minutes after the session end. The heart rate of recovery on time trend for both groups, control and caffeine group were significantly different ($p < 0.05$). As there was an interaction effect between control and caffeine group in recovery heart rate with the time trend in UPSI sprinters, which the HRR of caffeine group was linearly decreasing from the first minute to the 60th minute lower than the control group. HRR of control group was also decreasing linearly but higher than the caffeine group from the first minute to 60th minute. Thus, caffeine does help sprinters to recover faster within a safe limit of caffeine dosage intake.



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LIST OF ABBREVIATIONS

UPSI University Pendidikan Sultan Idris

HR Heart rate

HRR Heart rate recovery

BP Blood pressure



CHAPTER 1

INTRODUCTION

1.1 RESEARCH BACKGROUND

There are few factors that affect the performance and recovery of an athlete. Caffeine is one in all the foremost-consumed substances within the world. It is come in various foods such as coffee, teas, energy drinks, supplements and medicines and known for its psychoactive and ergogenic capacity in long-term exercise (Spriet, 2014). However, it may act differently on habitual drinkers of caffeine. Some researchers said caffeine helps in widening the arteries so could improve mental alertness and step-up energy during exercise. Nevertheless, in sports industry caffeine was believed to be consumed in order to enhance performance of the athlete. A few studies have appraised its effects during post-exercise recovery, which is a critical period in several modifications occur, among the athletes are changes in autonomic modulation (Lahiri et al., 2012) which may affect an environment conducive to the development of rhythm disturbances, abnormal responses of heart rate (HR) and blood pressure (BP) in predisposed



individuals (Lahiri et al., 2012). Thus, caffeine does give effect towards sympathetic nervous system among them during post exercise.

Recovery from exercise and competition may be a vital component of the overall exercise training paradigm and paramount for high-level performance and continued improvement. It is a phase where the body will be back to normal state and achieve its resting heart rate, blood pressure and body temperature. Based on Gonzaga, Vanderlei, Gomes & Valenti (2017) stated that post exercise recovery is a change in autonomic modulation that can promote an intercurrent-flavorable environment. In addition, heart rate recovery after training cessation could lead to the reflection of the rate of establishment of physical function (An, Park & Kim, 2014). The cessation of training can drop the heart rate reading because it re-establishes parasympathetic tone and cardiac output decrement. However, the recovery of heart rate reading may vary by individual except to the athletes and people who exercise regularly which



believed to recover faster. There are different opinions and outcomes from some reported research in heart rate recovery between ordinary people, people with chronic disease and athletes.

Sprinter is a person who runs in a short distance. Additionally, their body use Adenosine-Triphosphate Phospho-Creatine (ATP-PC) energy system in which the duration of activity is within 2 to 10 seconds (Plowman & Smith, 2007). A research reported that sprinters and untrained individuals had higher heart rate than distance runners. In Universiti Pendidikan Sultan Idris (UPSI), sprinters are produced by an athletic club named, Fox UPSI. Starting with the short distance athletes to the long distant event runner are trained under the Fox. All of them are students of UPSI and undergo training for 4 to 5 days a week according to their training program prepared by the coaches. They believe to have a stable level of fitness and ready to be tested.





1.2 PROBLEM STATEMENT

Performances of sprinters are being measured by their best time taken in a race event. Thus, one of the vital components is the cardiovascular strength. Cardiovascular strength can be achieved by aerobic training. Most of energy drink on the market sold mostly containing caffeine, which may lead to mental and physical alertness of the athletes. Likewise, a study by Ahn, Park & Kim (2014) reported heart rate recovery varies by individual yet athletes who exercise and train regularly will recover faster. With regards to this, no study has been done to explore the effect of caffeine on recovery in sprinters. Hence, this research is to elucidate the effects of caffeine on heart rate of post-exercise recovery among sprinters of Universiti Pendidikan Sultan Idris (UPSI).



1.3 PURPOSE OF THE STUDY

The purpose of the study is to identify the effect of caffeine on recovery heart rate in UPSI Sprinters. Individual heart rate produced may vary at different time of the day and their food intake.

1.4 OBJECTIVES OF THE STUDY

1. To review the effects of caffeine on the recovery in sprinters of Universiti Pendidikan Sultan Idris.
2. To identify the relationship between caffeine and recovery in sprinters.

1.5 HYPOTHESES OF THE STUDY

1. There is no statistically significant effect of the caffeine toward recovery heart rate of UPSI sprinters.
2. There is no statistically significant effect on the time trend of heart rate recovery on UPSI sprinters.
3. There is no statistically significant interaction between the caffeine toward recovery heart rate and the time trend of heart rate recovery UPSI sprinters.

1.6 IMPORTANCE OF THE STUDY

Even though there were a lot of studies had been done on caffeine and post-exercise recovery in every type of sports should be made in order to improve the implementation process of past studies as well as explore more new issues. The importance of the research is to provide some exposure to the athletic coaches on giving supplements to the athletes in order to improve their recovery after undergoing some sessions of training. Moreover, this research can also be used as a reference for future researchers who want to make pertinent study on caffeine effects on post-exercise recovery. Last but not least, can give some feedbacks on the recovery heart rate in physical fitness of UPSI Fox athletics club's athletes.

1.7 STUDY LIMITATION

Research was conducted only involving male UPSI sprinters. However, some factors will affect the study such as age, body weight and height of the athlete because those are the factors that hard to be controlled. Next, the sample selection will not take into consideration the religion and races factors. Lastly, the sample were only selected for their activeness in training as they preparing themselves for tournament.