



**UNIVERSITI PUTRA MALAYSIA**

***CREATINE MONOHYDRATE INTERVENTION ON THE  
CARDIOVASCULAR FITNESS, BODY COMPOSITION,  
AEROBIC AND ANAEROBIC PERFORMANCE AND  
TOTAL ENERGY EXPENDITURE AMONG ADULTS***

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AMONG ADULTS**

**By**

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**September 2012**

**Chairman: Professor Muhammad Nazrul Hakim Bin Abdullah, PhD**

**Faculty: Educational Studies**

While safety and health concerns have been raised by various professional groups regarding creatine supplementation, no study has reported any effect from creatine supplementation on the cardiovascular fitness and adults population. The aim of this study was to assess the effect of creatine monohydrate on the aerobic and anaerobic performance, cardio vascular function during high intensity aerobic exercise, total energy expenditure and cardiovascular risk factors. Creatine monohydrate has been known as a popular supplement among athletes. The effect of the creatine monohydrate on the anaerobic performance has been studied, although, its effects on the cardiovascular fitness aspect need to be investigated deeply. The present study was conducted to carry out four steps on the postgraduate students in UPM. A total

number of 354 male and female UPM students were participated in this research. At the first step, using an online survey, the consumption of creatine monohydrate and other supplements was studied.

According to the survey, creatine was not a popular supplement among the students. At the second phase, the effect of creatine monohydrate on the cardiovascular fitness was examined. For this purpose, the effect of creatine monohydrate on the cardiovascular risk factors including lipoproteins profile and homocysteine concentration was investigated. An increase in HDL concentration was shown in the result of creatine consumption, although, this effect was not statistically significant. The data also showed no significant change in the blood level of LDL and homocysteine in the creatine-treated group compared to the controls. It was also shown that stroke volume during the high intensity aerobic exercise can be increased with creatine supplementation, while at the placebo group showed a decrease in the same condition. However, this difference was not statistically significant. Increasing in the body mass index and body fat percent was observed in the creatine-treated group. Significant effect of creatine supplement on the total energy expenditure during high intensity aerobic exercise was also revealed. Analysing data by manova also has shown that there was not positive effect by creatine supplement on group of DV (Fat free mass, Body mass index, Body fat percent, Stoke Volume, Homocysteine, Low density lipoprotein and High density lipoprotein) as the cardiovascular fitness parameters.

At the next section of the research, the effect of creatine monohydrate in combined with resistance exercises on anaerobic and aerobic performance was investigated.

Data analysis showed no significant effect of creatine consumption on the anaerobic and aerobic performance of the participants.

The most obvious finding of the present study was demonstrating some other aspect of creatine monohydrate in effecting on the human body, specifically for inactive adults. However, to make better the other aspects of creatine monohydrate in the human body, more experimental researches are recommended.



Abstrakt tesis yang dikemukakan kepada Senat Universiti Putra Malaysia  
sebagai memenuhi keperluan untuk ijazah Doktor Falsafah

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Tujuan projek ini dijalankan adalah untuk menilai kesan kreatin monohidrat terhadap prestasi aerobik dan anaerobik, fungsi kardiovaskular semasa senaman aerobik berketahanan tinggi, jumlah penggunaan tenaga dan faktor risiko kardiovaskular. Kreatin monohidrat dikenali sebagai makanan tambahan yang popular dalam kalangan atlit. Walaupun kajian ke atas kesan kreatin monohidrat terhadap prestasi anaerobik telah dijalankan, namun, kesannya kepada aspek kecergasan perlu dikaji dengan lebih mendalam. Kajian ini telah dijalankan kepada 354 pelajar pascasiswazah UPM, lelaki dan perempuan melalui empat fasa. Fasa pertama ialah melalui kaji selidik dalam talian di mana penggunaan kreatin monohidrat dan makanan tambahan lain telah dikenalpasti.

Berdasarkan hasil kaji selidik, kreatin merupakan makanan tambahan yang tidak popular dalam kalangan pelajar. Pada fasa kedua, kesan kreatin monohidrat terhadap kecergasan kardiovaskular telah diuji. Bagi tujuan ini, kesan kreatin monohidrat terhadap faktor risiko kardiovaskular termasuk profil lipoprotein dan kepekatan homosistein telah dikaji. Hasil kajian ini menunjukkan kepekatan HDL bertambah terhadap penggunaan kreatin, namun, kesan ini tidak berkadar statistik. Data juga menunjukkan tiada perubahan LDL dalam paras darah dan homosistein dalam kumpulan olahan-kreatin berbanding pemalar. Selain itu, isipadu strok meningkat semasa senaman aerobik berketahanan tinggi dengan pengambilan makanan tambahan kreatin manakala kumpulan placebo menunjukkan penurunan pada kondisi yang sama. Walaubagaimanapun, perbezaan ini tidak berkadar statistik. Peningkatan dalam indeks jisim badan dan peratusan lemak badan telah dikenalpasti dalam kumpulan olahan-kreatin. Kesan signifikan makanan tambahan kreatin terhadap jumlah penggunaan tenaga semasa senaman aerobik berketahanan tinggi juga dapat diketahui. Data analisis melalui manova juga menunjukkan tiada kesan positif oleh makanan tambahan kreatin kepada kumpulan DV (jisim lemak bebas, indeks jisim badan, peratusan lemak badan, isipadu strok, homosistein, lipoprotein berketumpatan rendah dan lipoprotein berketumpatan tinggi) sebagai parameter kecergasan kardiovaskular.

Pada fasa kajian yang seterusnya, kesan gabungan kreatin monohidrat dengan senaman ketahanan terhadap prestasi anaerobik dan aerobik telah dikaji. Analisis data menunjukkan tiada kesan signifikan penggunaan kreatin terhadap prestasi anaerobik dan aerobik para peserta.

Penemuan yang paling jelas dalam kajian ini menunjukkan aspek lain kreatin monohidrat dalam memberi kesan terhadap badan manusia khususnya kepada orang dewasa yang tidak aktif. Oleh itu, demi penambahbaikan aspek lain kreatin monohidrat, dicadangkan agar lebih banyak kajian eksperimen dilaksanakan.





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## **APPROVAL**

I certify that a thesis Examination Committee has met on 19 September 2012 to conduct the final examination of Alireza Amani's on his thesis entitled "Creatine Monohydrate Intervention on the Cardiovascular Fitness, Aerobic and Anaerobic Performance and Total Energy Expenditure among Adults" in accordance with the Universities and University Colleges Act 1971 and constitution of the Universiti Putra Malaysia [P.U.(A) 106] 15 March 1998. The committee recommends that student be awarded the Doctor of Philosophy.

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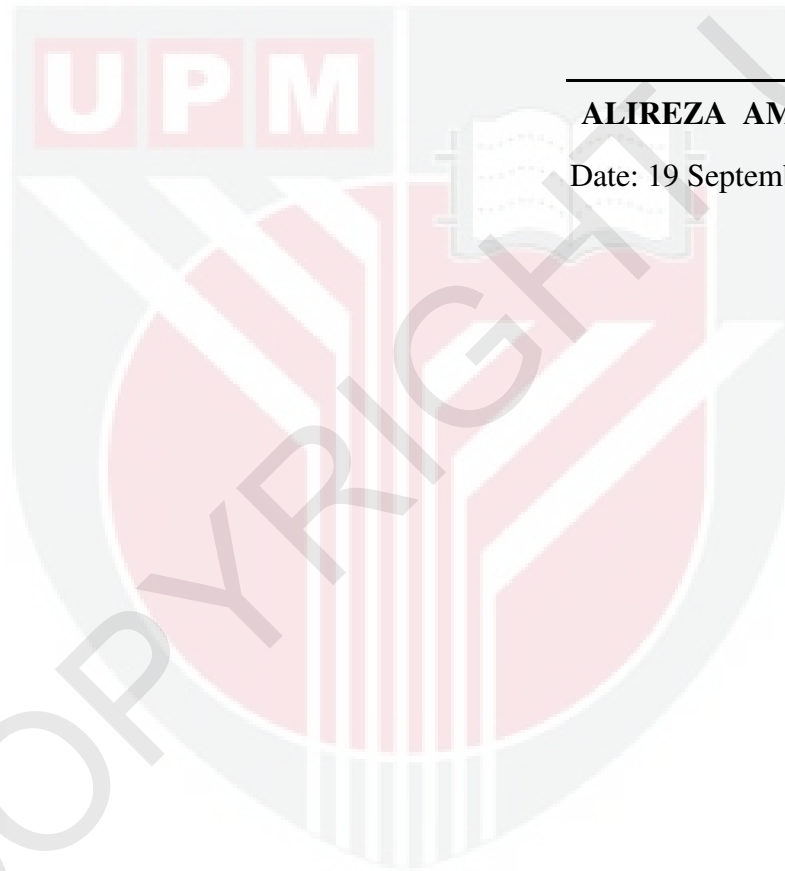
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## DECLARATION

I declare that the thesis is my original work except for quotation and citation which have been duly acknowledged I also declare that it has not been previously, and is not concurrently, submitted for any other degree at Universiti Putra Malaysia or at any other institution.



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**ALIREZA AMANI**

Date: 19 September 2012

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