UNIVERSITI TEKNOLOGI MARA

HANDGRIP STRENGTH AND ITS ASSOCIATION WITH PHYSIOLOGICAL VARIABLES AND FAT FREE MASS INDEX AMONG CARDIAC PATIENTS

SITI NUR BAAIT BINTI MOHD SOKRAN

Thesis submitted in fulfillment
of the requirements for the degree of
Master of Science

Faculty of Health Science

November 2016

ABSTRACT

Cardiac disease patients showed alterations in muscle strength, body composition and coronary function. This study focused on exploring the relationship between handgrip strength, Left ventricular ejection fraction (LVEF), body composition and myocardial oxygen consumption (MVO_2) index among cardiac disease patients.This is a cross-sectional study involving 77 subjects and it was carried out in two phases among cardiac patients with surgical and conservative management. Subjects were recruited based on selection criteria as set by the study protocol. In the preliminary study, 27 patients who underwent cardiac surgery were subjected to handgrip strength and MVO_2 index pre and post surgery. Spearman-rank correlation, simple linear regression analysis and MANOVA were used to analyse the study results. In the main study, 50 cardiac patients recruited and handgrip strength measurement was conducted using Jamar hand dynamometer followed by measurement of body composition using hand-held BIA. Then, the subjects were assessed for MVO_2 index. The preliminary study results showed that there were significant interactions ($p < .001$) for both handgrip strength with large effect sizes (dominant handgrip x MVO_2 index: $\eta_p^2 = .44$; non-dominant handgrip x RPP: $\eta_p^2 = .49$) with MVO_2 index pre and post-surgery. This signifies that handgrip strength had effects on MVO_2 index pre and post-surgery. The main study outcome showed relationship between bilateral handgrip strength with LVEF and MVO_2 index among cardiac patients. FFMI showed a negative relationship with dominant handgrip strength among male subjects (ρ=-.0004, $p>.005$). Simple linear regression analysis demonstrated an interaction between non-dominant handgrip strength and LVEF (R^2=.081, $p <0.05$) with small effect size, both handgrip strength and MVO_2 index (R^2=.334, $p<.001$) with small effect size. The study findings show that there is an interaction found between handgrip strength and MVO_2 index pre and post-surgery among cardiac surgical patients. There is an association found between handgrip strength with MVO_2 index and LVEF among cardiac patients. However, no relationship was found between handgrip strength and body composition. Hence, it might be inferred that handgrip strength could be used as a predictor to assess MVO_2 index among cardiac subjects.

ACKNOWLEDGEMENTS

I would like to thank Allah s.w.t for his greatness then we would ever be able to complete this thesis to the fullest. I would like to express my deepest appreciation to all those who provided me a possibility to complete this thesis. A fullest gratitude to my supervisor Mr. Vikram Mohan who had spent much of his time stimulating suggestion and encouragements which helped me a lot to coordinate my project. He has been a great mentor and supervisor. Plus all the critics that builds me, what I am now. I really appreciate all the kindness and patience towards me.

Furthermore, my gratitude goes to my husband for his support and love throughout my journey. He has given me constant encouragement and has made many sacrifices. I would like to acknowledge my children as my motivator to continue my study even though there are many obstacles and challenges. My parents has been very supportive and giving me motivation to keep on going with my study.

Besides that, I would like to thank my co-supervisor Dato Dr Mohd Sulaiman for his effort and guidance I really appreciate the effort and assistance he had put in my project.

Besides that, I also would like to acknowledge KPJ Damansara Hospital for providing me resources to complete my project. Finally, I would like to acknowledge the management of KPJ University College for the support all the individuals that involve and sacrifice their time for my study. Without their generosity, this project would never have been completed.

TABLE OF CONTENTS