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The benefits of resistance training on blood lipid profile and body composition in Māori men

A thesis presented in partial fulfilment of the requirements for the Degree of Master of Science

In

Exercise and Sport Science

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Abstract

Objectives: The primary objective of this study was to determine whether 12 weeks of resistance training at time periods of three, 30 minute sessions per week would provide enough stimuli to reduce the cardiovascular disease (CVD) risk of blood lipid profile and body composition in sedentary Māori (Indigenous New Zealanders) men.

Methods: The study cohort consisted of a convenience sample of 16 Māori males aged 28 – 60y. Participants completed a resistance training intervention consisting of three 30 minute sessions per week for 12 weeks. Measures of pre- and post-BMI, waist to hip ratio (WHR), body composition and fasting lipids were made. Pre-, mid-, and post-intervention assessments of strength, aerobic fitness, body composition and blood composition were also undertaken. Exercise was controlled five days prior to the testing; whilst diet was restricted -12 hours prior to blood tests.

Results: Percentage body fat was significantly lower after the 12 week resistance training intervention (P<0.001) and lean body mass (LBM) was significantly higher (P<0.015). A reduction in low density lipoprotein cholesterol (LDL-c) occurred (P<0.039), though a high density lipoprotein cholesterol (HDL-c) (P <0.8), body mass index (BMI) (P<0.469), and waist to hip ratio (WHR) (P <0.196) were not significantly different after completion of the intervention.

Conclusions: This was the first study to investigate the effect of half hour resistance training bouts, three times per week on male Māori as a modality to alter their CVD risk profile. These findings support the hypothesis that resistance training can improve CVD risk profile through a change in body composition; namely a reduction in percentage body fat, increase in LBM, and a reduction in LDL-c. Although in this cohort this intervention has proved effective, further studies of larger populations are required to get a stronger level of significance.
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Explanation of Māori terms

Hauora – Wellness, health.

Hinengaro – Mind, thoughts; in context of Māori health, hinengaro represents mental health and wellbeing.

Hui – Meeting.

Kai – Food.

Karakia – Prayer.

Kaumātua – Respected elders in the Māori community that have been involved with their whānau for many years.

Kaupapa Māori Research – Research methodology based on Māori ideology, values.

Mana – Authority, influence prestige, honour.

Marae – Meeting place.

Matauranga – Knowledge, comprehension or understanding of everything visible and invisible.

Mauri – Life force/spirit.

Mauriora – Access to te ao Māori (As expressed in Te Pae Mahutonga).

Patu – Traditional Māori club weapon.

Taiaha – Traditional Māori staff-like weapon used for striking and thrusting in combat.

Te Oranga – Participation in society (As expressed in Te Pae Mahutonga).

Te Pae Mahutonga – Māori model of health designed by Mason Durie, which underpins the Te Whare Tapa Whā.

Te Wheke – A Māori model of health also known as the Octopus model.

Tinana – Physical body; in context of Māori health, tinana represents physical wellbeing.
Toiora – Healthy lifestyles (As expressed in Te Pae Mahutonga).

Waiora – Environmental protection (As expressed in Te Pae Mahutonga).

Wairua – Spirit, soul, represents spiritual wellbeing in the context of Māori health.

Whakatau – Welcome used to begin a hui.

Whānau – Extended family, family group.

Whanaungatanga – Kinship, family connection. Relationship through shared experience.

Wharenui – Meeting house.

Whare Tapa Whā – A Māori model of health with four facets of health.
Abbreviations

1RM – 1 Repetition Maximum
ACSM - American College of Sports Medicine
AHA – American Heart Association
ANOVA – Analysis of Variance
BMD – Bone Mineral Density
BMI – Body Mass Index
BMR – Basal Metabolic Rate
CAD – Coronary Artery Disease
CHD – Coronary Heart Disease
CI – Confidence Interval
CO₂ – Carbon Dioxide
CVD – Cardiovascular Disease
DVT – Deep Vein Thrombosis
DXA – Dual-Energy X-Ray Absorptiometry
FFA – Free Fatty Acids
FM – Fat Mass
FT – Fasting Triglycerides
HDL – High Density Lipoprotein
HDL-c - High Density Lipoprotein Cholesterol
HPL – Human Performance Laboratory
HR – Heart Rate
IFNHH – Institute of Food Nutrition and Human Health
IHD – Ischemic Heart Disease
L - Litres
LBM – Lean Body Mass
LDL – Low Density Lipoprotein
LDL-c – Low Density Lipoprotein Cholesterol
MI – Myocardial Infarction
MLC – Med Lab Central
MPH – Miles per Hour
n – Number of Participants
O₂ – Oxygen
PARQ – Physical Activity Readiness Questionnaire
PASW – Predictive Analytics SoftWare (formerly SPSS)
QDR – Quantitative Digital Radiography
RER – Respiratory Exchange Ratio
SD – Standard Deviation
SE – Standard Error
SNZ – Sport New Zealand
SPARC – Sport and Recreation New Zealand
SRI – Sport and Rugby Institute
SST – Serum Separator Tubes
STPD – Standard Temperature Pressure Dry
TC – Total Cholesterol
VCO₂ – Carbon Dioxide Production
VO₂ – Oxygen Uptake
VO₂ max – Maximal aerobic capacity
WHO – World Health Organisation
WHR – Waist to Hip Ratio
Y – Years