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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

Massey University, Manawatū, New Zealand

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2014

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.

Acknowledgements

I would like to thank the following people for their help and guidance throughout the process of completing this thesis.

First and foremost, Mum, without your love, support and encouragement I would have not known my limits; you have always pushed me to go further and achieve more in life and for that I will be forever grateful and cannot express how much your words of wisdom mean to me.

Dr Isaac Warbrick, my supervisor, for your continued belief, guidance, knowledge and understanding as I bombarded you with questions and ideas about this project. You have been a constant source of knowledge and inspiration throughout this project to me.

My co-supervisors, Dr Geoff Kira and Dr Steve Stannard, for their advice and assistance throughout this project.

Acknowledgements are due to Professor Hugh Morton who helped process and organise my statistical analysis, and to Mr Bevan Erueti who taught me to understand some of the more in-depth Māori aspects of the study I conducted.

To the participants (B.R.Os), for all the laughs, good times, and hard work you all put in; without you guys this research could not have taken place.

To Jo, my partner for putting up with my hours of study, and being there for me throughout this process; and for your unwavering support and encouragement when things were overwhelming and I wanted to throw in the towel.

Special thanks are due to Dr's Matt Barnes, Darryl Cochrane, and Toby Mündel, all of whom have taught and inspired me during my time here at Massey. You all have played a massively influential role in my education and for that I am extremely grateful.

Table of Contents

Abstract	II
Acknowledgements.....	III
Table of Contents	IV
List of tables	VII
Explanation of Māori terms	VIII
Abbreviations	X
1. Introduction	1
1.1 Hypothesis.....	7
2. Literature review	8
2.1 What is cardiovascular disease	8
2.2 CVD risk factors	9
2.2.1 Non modifiable risk factors	10
2.2.1.1 Age.....	10
2.2.1.2 Gender.....	10
2.2.1.3 Family history	11
2.2.1.4 Ethnicity.....	11
2.2.2 Modifiable risk factors.....	12
2.2.2.1 Physical inactivity (sedentary lifestyle)	12
2.2.2.2 Obesity	13
2.2.2.3 Hypercholesterolemia	15
2.3 Exercise training adaptation.....	17
2.3.1 Exercise and CVD.....	18
2.3.2 Exercise modalities prescribed.....	19
2.3.2.1 Resistance training and CVD	20
2.4 Kaupapa Māori	22
3. Methods	24
3.1 Participants.....	24
3.2 Study design	25
3.2.1 Kaupapa Māori design.....	26
3.3 Outcomes	26
3.3.1 Pre experimental protocol	27
3.4 Experimental protocol.....	27

3.4.1	Blood sampling.....	27
3.4.1.1	Lipid profile.....	28
3.4.2	Resting measures	28
3.4.3	Body composition.....	29
3.4.4	Strength measurements.....	30
3.4.5	Safety precautions.....	30
3.5	Intervention.....	30
3.6	Training programmes	31
3.7	Statistical analyses	31
3.8	Exercise views of participants	32
4.	Results	33
4.1	Compliance.....	33
4.2	Physical characteristics.....	33
4.3	Cholesterol	35
4.4	Post exercise questionnaire	38
4.4.1	Taha Tinana	39
4.4.2	Taha Hinengaro	39
4.4.3	Taha Whānau	40
4.4.4	Taha Wairua	41
4.4.5	Conclusion	41
5.	Discussion.....	42
5.1	Body composition.....	43
5.2	Biochemical	45
5.3	Exercise protocol.....	47
5.3.1	Training type.....	47
5.3.2	Training duration.....	47
5.4	The Application of a Kaupapa Māori approach.....	48
5.5	Considerations/limitations.....	51
5.6	Future research	52
6.	Conclusions	53
7.	References.....	54
8.	Appendices	i
	Appendix A – Training Programmes.....	i
	Appendix B – Post Exercise Questionnaire	iv

Appendix C - PARQv
Appendix D – Recruitment Flyervi
Appendix E – Information Sheetvii

List of figures

Figure 4-1 Mean (\pm SE) of percentage body fat pre intervention, at six weeks and at 12 weeks of the resistance training intervention (n=15).

List of tables

Table 4.1 Change in LBM, total body fat, LDL and HDL cholesterol at pre, 6wk and 12wk (mean \pm SD).

Table 4.2 Change in LDL-c from pre training to 12 weeks of resistance training (mean \pm SD).

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