

Copyright is owned by the Author of the thesis. Permission is given for a copy to be downloaded by an individual for the purpose of research and private study only. The thesis may not be reproduced elsewhere without the permission of the Author.

Filipino Women's Health Study

A thesis presented in partial
fulfilment of
the requirements for the degree of

Master of Science
in
Nutrition and Dietetics

at Massey University, Albany,
New Zealand.

Liana Norrish

2017

ABSTRACT

Background: Western acculturation has been shown to be detrimental to health outcomes. Recently, more Filipinos are migrating to New Zealand, which may increase lifestyle-related chronic diseases. Furthermore, Filipino populations already have a higher incidence of chronic disease and less favourable health outcomes than their Western counterparts. Understanding their risk will assist development of public health initiatives which can be utilised to protect the health of the growing Filipino New Zealand migrant population. **Aim:** The aim of this study was to investigate the risk of developing type 2 diabetes mellitus and cardiovascular disease among recently immigrated Filipino women **Method:** 62 recently-immigrated Filipino women, aged 19-45, were recruited from Auckland, New Zealand. A health and demographic information questionnaire was completed. Anthropometric measurements (height, weight, and waist circumference) and blood pressure were measured. Both total and percent body fat were determined using dual energy X-ray absorptiometry. Fasting glucose, insulin, and lipids were measured. Physical activity data was monitored by accelerometers and two-day food diaries were completed. Homeostasis Model Assessment 2 was used to quantify insulin resistance. The 30-year Framingham Risk Score was used to classify participants into low-, medium-, or high-risk of developing cardiovascular disease. Prevalence of metabolic syndrome according to the modified National Cholesterol Education Programme criteria was determined. **Results:** Body mass index, waist circumference, and percent body fat were positively correlated with higher insulin resistance. Smokers had higher insulin resistance than non-smokers. However, 90% of participants had a low long-term risk of developing cardiovascular disease and 10% of participants met the metabolic syndrome criteria. This study was cross-sectional and provided used self-selection sampling. **Conclusion:** Anthropometric measures and smoking were associated with higher insulin resistance in participants. Participants with metabolic syndrome (10%) were at a greater risk of developing type 2 diabetes mellitus. This study highlights the risk of diabetes and cardiovascular disease development, and the need for further research, in this Filipino migrant population. These findings also create a platform for improving New Zealand health programmes by targeting appropriate risk factors to improve insulin sensitivity and reduce risk of developing diabetes, and will help to raise awareness in the Filipino community.

ACKNOWLEDGEMENTS

First, I would like to acknowledge my almighty God, for his evident faithfulness and goodness throughout this time.

A massive thank you to my academic supervisor Dr Pamela von Hurst. Always in hand with a supportive word of encouragement, your patience in answering my many queries is truly appreciated. Your knowledge and guidance has been invaluable throughout the entire process of my research. I am also very grateful to my co-supervisor Rachel Page, with her expertise in metabolic health, provided me with guidance throughout and assisted with the final editing of the writing process.

I am also deeply indebted to Rio Monzales, it was a pleasure and honour working with you. I greatly appreciate all the time and hard work you put into recruiting the participants and making everything smooth sailing. I would also like to thank Owen Mugridge for your help during the data collection process.

To the 62 participants involved in this study, I would also like to express a profound gratitude. This study could not have been successfully conducted without your willingness and contribution.

I would also like to thank my friends and dietetic classmates who made the past two years a much richer experience. A special thank you to Melaney, Shivon, Anna, Emily, and Danika for the long-lasting friendships and memories we have created. To my inseparable classmate, friend, and flatmate, Dushanka, I want to express heartfelt thanks for your encouraging words and boundless support. We have been through a rollercoaster journey together and I could not imagine doing this without you by my side every step of the way. To Ernest, thank you for always listening and being my rock during the stormy times.

I cannot end without expressing my sincerest gratitude towards my Mum and Dad, without whose unwavering love and support throughout my years of study this thesis would not have been possible. Thank you for always believing in me. Finally, I would also like to thank my sister, Melinda Norrish, for giving me much needed breaks during the research process and always supporting my dreams.

TABLE OF CONTENTS

ABSTRACT	II
ACKNOWLEDGEMENTS	III
TABLE OF CONTENTS	IV
LIST OF TABLES	VII
LIST OF FIGURES	VIII
LIST OF APPENDICES	IX
ABBREVIATIONS	X
CHAPTER 1: INTRODUCTION	1
1.1 BACKGROUND	1
1.2 PURPOSE OF THE STUDY	4
1.3 AIMS AND OBJECTIVES	4
1.3.1 <i>Aim</i>	4
1.3.2 <i>Objectives</i>	4
1.4 THESIS STRUCTURE	5
1.5 RESEARCHERS' CONTRIBUTIONS	5
CHAPTER 2: LITERATURE REVIEW	6
2.1 FILIPINO MIGRATION INTO NEW ZEALAND	6
2.2 HEALTH OF FILIPINOS IN NEW ZEALAND.....	7
2.3 HEALTH OF IMMIGRATED FILIPINOS IN OTHER WESTERN COUNTRIES	8
2.4 ASIAN HEALTH IN NEW ZEALAND	10
2.5 DEFINING METABOLIC SYNDROME (METS)	11
2.6 RISK FACTORS FOR TYPE 2 DIABETES MELLITUS AND CARDIOVASCULAR DISEASE	12
2.6.1 <i>Risk Assessment of Cardiovascular Disease</i>	13
2.6.2 <i>Age</i>	14
2.6.3 <i>Atherogenic Dyslipidaemia</i>	14
2.6.4 <i>Insulin Resistance</i>	15
2.6.4.1 Measuring Insulin Resistance	16
2.6.5 <i>Hypertension</i>	16

2.6.6 Diet.....	18
2.6.7 Physical Inactivity.....	20
2.6.8 Cigarette Smoking.....	22
2.6.9 Overweight/Obesity.....	23
2.6.10 Socio-Economic Status.....	24
2.6.11 Sleep Disturbances.....	25
2.6.12 Genetics.....	27
2.7 HEALTH CARE AND COST IMPLICATIONS.....	27
2.8 SUMMARY.....	28
REFERENCES.....	ERROR! BOOKMARK NOT DEFINED.
CHAPTER 3: RESEARCH STUDY MANUSCRIPT.....	30
3.1 ABSTRACT.....	32
3.2 INTRODUCTION.....	33
3.3 MATERIALS AND METHODS.....	34
3.3.1 Study participants.....	35
3.3.2 Study design.....	35
3.3.3 Criteria for the metabolic syndrome.....	35
3.3.4 Health and demographic characteristics.....	35
3.3.5 Anthropometric measurements.....	36
3.3.6 Total body composition.....	36
3.3.7 Biochemical measurements.....	36
3.3.8 Dietary assessment.....	37
3.3.9 Physical activity.....	37
3.3.10 Blood pressure.....	37
3.3.11 Insulin resistance.....	37
3.3.12 Cardiovascular risk assessment.....	38
3.3.13 Statistical analysis.....	38
3.4 RESULTS.....	38
3.5 DISCUSSION.....	42
3.6 ACKNOWLEDGEMENTS.....	46
3.7 AUTHORS DISCLOSURES.....	46

REFERENCES	46
CHAPTER 4: CONCLUSION-RECOMMENDATION.....	53
4.1 OVERVIEW.....	53
4.2 STRENGTHS.....	53
4.3 LIMITATIONS	54
4.4 FINAL RECOMMENDATIONS.....	55
REFERENCES	56
APPENDICES	72

LIST OF TABLES

TABLE 1.1 Researchers’ contributions **5**

TABLE 2.1 Clinical diagnosis of metabolic syndrome using the modified NCEP ATP
III definition **14**

TABLE 2.2 Traditional Filipino Foods **21**

TABLE 3.1 WHO International BMI Classification **52**

TABLE 3.2 Characteristics of all participants **55**

TABLE 3.3 Blood pressure and biochemical measurements of all participants **56**

TABLE 3.4 HOMA2-score and Framingham 30-year cardiovascular risk score of all
participants **57**

TABLE 3.5 Dietary intake of all participants **56**

LIST OF FIGURES

FIGURE 1.1 Trends in diabetes prevalence in the Philippines and in New Zealand **2**

FIGURE 2.1 Filipino Ethnic Group in New Zealand from the 2001, 2006, and 2013
Censuses **6**

FIGURE 2.2 Proportional mortality in the Philippines and New Zealand **9**

FIGURE 2.3 Adults with multiple chronic conditions in the United States, by non-
Hispanic Asian subgroup, 2010-2014 **11**

LIST OF APPENDICES

APPENDIX A Consent Form **73**
APPENDIX B Information Sheet **74**
APPENDIX C Health and Demographics Questionnaire **78**
APPENDIX D 2-Day Food Diary **83**
APPENDIX E Physical Activity Diary **96**

ABBREVIATIONS

AHA	American Heart Association
AMDR	Acceptable Macronutrient Distribution Range
BMI	Body Mass Index
CHIS	California Health Interview Survey
CVD	Coronary Heart Disease
cm	Centimetre
CVD	Cardiovascular Disease
DXA	Dual-Energy X-Ray Absorptiometry
FNRI	Food and Nutrition Research Institute
IDF	International Diabetes Foundation
kg	Kilogram
m	Metre
MetS	Metabolic Syndrome
MOH	Ministry of Health
NCEP ATP III	National Cholesterol Education Programme Adult Treatment Panel III
NHIS	National Health Interview Survey
NHLBI	National Heart, Lung and Blood Institute
NRV	Nutrient Reference Value
T2DM	Type 2 Diabetes Mellitus
VAT	Visceral Adipose Tissue
WC	Waist Circumference
WHO	World Health Organisation
WHR	Waist-to-Hip Ratio