# Investigation of nutrition risk in community living adults aged 75 years and older: prevalence and associated physical health factors

---

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

**Master of Science**

in

**Nutrition and Dietetics**

**Massey University**

Albany

New Zealand

**Vicki Jean Williams**

2016

# Abstract

***Background:***

New Zealand's population is ageing. Given prevalence of functional disability and chronic disease increases with age, and older adults account for one third of health loss in New Zealand, supporting older adults to maintain independence is paramount to reducing future health care costs. A compromised nutritional status, and declining muscle mass, strength and function threatens independence. This study aims to investigate the prevalence of nutrition risk, and identify associated socio-demographic and physical health factors among community-living older adults aged 75 years and older.

***Methods:***

A total of 200 participants were recruited from eligible patients enrolled at the Henderson Medical Centre. Baseline sociodemographic, and health information was collected using an interview style questionnaire. Body composition, including muscle mass was estimated using Bioimpedance Analysis (BIA). Muscle strength was assessed using a hand held dynamometer to measure grip strength, and a Five Times Sit To Stand (5TSTS) test. Lower extremity function performance was assessed using 2.4 meter gait speed. Validated screening tools identified nutrition status (Mini Nutritional Assessment Short Form MNA-SF), swallowing status (10 item Eating Assessment Tool EAT-10), and cognitive status (Montreal Cognitive Assessment MoCA). Pearson's Coefficient Correlations were used to identify associations between nutrition risk and physical health nutrition risk factors.

***Results:***

The study sample (n= 200) included 89 (44.5%) men, and 111 (55.5%) women with a mean age of 80.5 years. The MNA-SF identified 2 (1%) malnourished participants, and 24 (12%) participants at risk of malnutrition. MNA-SF scores were positively correlated with a lower BMI (r=0.257, p=<0.001), lower muscle mass, lower calf circumference (r=0.333, p=<0.001), lower percentage of body fat (r=0.287, p=<0.001), and weaker grip strength

(r=0.143, p=0.047). MNA-SF scores had an inverse correlation with EAT-10 scores indicating dysphagia risk (r=0.182, p=<0.010).

***Conclusion:***

A low prevalence of malnutrition was found in this study population. Those at risk of malnutrition or malnourished were more likely to use support services, be at risk of dysphagia, have a low BMI, low muscle mass, a lower calf circumference, lower percentage of body fat, and poor muscle strength. Routine nutrition risk screening is recommended to identify at risk individuals early to prevent escalation to malnutrition and poor health.

**Key words:** Malnutrition, MNA-SF, Older Adults, Community, Dysphagia, Muscle Mass

# Acknowledgements

First and foremost, I would like to thank the participants who agreed to open your homes and allow me to gain valuable insight into your personal lives without which this study would not have been possible. I was inspired by the qualities of spirit, strength, and graciousness so prevalent in your generation. I can honestly say I thoroughly enjoyed meeting each and every one of you. Your generosity will help to serve those who follow you into their older years.

To my supervisor, Dr Carol Wham, I would like to thank you for your guidance, your support, and for sharing your passion for the nutritional wellbeing of older adults. Your extensive knowledge and experience was invaluable and greatly appreciated. I would also like to extend thanks to Dr Marilize Richter for your calming nature when statistical analysis of the results threatened to overwhelm me. To Dr Jacqui Allen and Teresa Stanbrook from the Waitemata District Health Board, thank you both for your support.

To all my fellow dietetic students, it was a pleasure to share this journey with you. A special thanks to Lisa and Sam who provided companionship and assistance when I needed it.

Last but by no means least I would like to thank my family. My partner Darren for your understanding, patience, and support through the ups and downs associated with the enormous task of completing a thesis while maintaining a role as a mother, business owner and partner. I would like also like to thank my mother, Jacqui, for always believing in me. And finally, to my sons, Alex and Thomas, who were forced to share their mother's attention for the past six years. I love you with all my heart, and thank you for your understanding and patience.

# Dedication

This thesis is dedicated to my grandmother, Jean Alexandra Fitzjohn who was born into a generation of women where continued education was often not an option. Her lifelong desire for learning inspired me to begin this journey of self-discovery and personal achievement. Her final 18 months, spent unable to eat food orally directed me to the field of dietetics. This achievement is for you Grandma.

11 July 1925 - 18 July 2011

# Table of Contents

# List of Tables

# List of Figures

# Abbreviations

| | |
|---|---|
| AD | Alzheimer's disease |
| ADL | Activity of daily living |
| ANSI | Australian Nutrition Screening Initiative |
| ANOVA | Analysis of Variance |
| BIA | Bioelectrical Impedance Analysis |
| BMI | Body Mass Index |
| CC | Calf Circumference |
| CHD | Coronary heart disease |
| cm | Centimeter |
| COPD | Chronic obstructive pulmonary disorder |
| DALY | Disability adjusted life year |
| DHB | District Health Board |
| DXA | Dual-Energy X-Ray Absorptiometry |
| EAT-10 | 10-Item Eating Assessment Tool |
| GI | Gastrointestinal |
| GP | General Practitioner |
| HDEC | Health and Disability Ethics Committee |
| ICD-10 | International Classification of Diseases $10^{th}$ revision |
| IHD | Ischaemic heart disease |
| kg | Kilogram |
| m | Meter |
| MCI | Mild cognitive impairment |
| MNA | Mini Nutritional Assessment |
| MNA-SF | Mini Nutritional Assessment-Short Form |
| MoCA | Montreal Cognitive Assessment |
| MRI | Magnetic Resonance Imaging |
| MST | Malnutrition Screening Tool |
| MUST | Malnutrition Universal Screening Tool |
| NRV | Nutrient Reference Value |
| OTC | Over the counter |
| PEM | Protein energy malnutrition |
| QOL | Quality of Life |
| RDI | Recommended Daily Intake |
| SCREEN II | Seniors in the Community: Risk Evaluation for Eating and Nutrition, Version II |
| SD | Standard Deviation |
| SMM | Smooth muscle mass |
| WDHB | Waitemata District Health Board |
| WHO | World Health Organization |
| Y | years |