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**Next Level Health: The Design, Implementation and  
Evaluation of a Programme to Empower Women Over Their Health**

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

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in  
Health Sciences

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# Abstract

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New Zealand women often experience a narrow focus on weight or body size as a barrier to health. This dominant Western “weight-centred” discourse conflates health with weight and disempowers women from gaining control and autonomy over their health. This thesis aimed to design, implement and evaluate Next Level Health (NLH); a strengths-based programme founded on values of empowerment and holistic health. NLH aims to empower women over their health through incremental behaviour change within the context of their daily lives across six domains: physical activity, sleep, nutrition, eating behaviour, self-care and stress management.

Fifty-eight women, aged 18-40 years completed NLH. A mixed-methods convergent design guided the evaluation of women’s outcomes and programme implementation. Data were collected via a series of surveys and physical measures. The outcomes assessed were women’s health-promoting behaviours (HPBs), physical, mental and social health and participant perceived outcomes. Process evaluation comprised the programme’s reach, fidelity and participant satisfaction. The findings were then analysed and integrated to determine women’s empowerment over their health.

Collectively, the outcomes women experienced after NLH contributed to their empowerment by increasing their capacity for HPBs, adopting and experiencing a holistic health approach and enhancing their autonomy regarding their HPBs, health development and ability to generate a sense of success. Additionally, eight factors were identified that were key attributes of the programme that contributed to women’s empowerment or were vital for evaluating their success: (1) a small goals approach; (2) dialogue; (3) social support; (4) a multidisciplinary approach; (5) a strengths-based approach; (6) a weight-neutral approach, (7) assessment across multiple health dimensions and (8) a mixed-methods design for evaluation.

In sum, the findings suggest that NLH successfully empowered women to gain greater control over their health. NLH overcomes common shortcomings of dominant health interventions by using a positive, multidisciplinary and empowering approach to promote women's health that was adaptable to individual contexts, and exhibits potential for producing sustainable change. The current study contributes a novel programme and comprehensive evaluation providing evidence for a small, yet growing, body of empowerment research to promote women's health.

# Preface

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This thesis combines my passions for people and health.

I have always had an innate curiosity for others. Every person I've met has had something new to offer, widening my perspective of the world one conversation at a time. How do they see the world? Why? What makes them unique? How do we differ? How are we the same? And how can we connect? I think people are interesting because they are defined, yet adaptive, which makes for endless exploring. I've had the luxury of meeting and connecting with many people from different countries, climates, cultures and upbringings – and I know that it doesn't even begin to scratch the surface of the human experience. I drive conversation with questions and each interaction uncovers new insight as to how life can be viewed and experienced in a myriad of ways. The people in my life are certainly, what make it so rich.

Alongside this curiosity I hold of others, I am fascinated by health, and more specifically, its many facets. Through my academic career, I have toed many paths unravelling concepts in medicine, anthropology, nutrition and health promotion. Regardless of the path where I stood, I was never fully committed to one. I loved demystifying the expertise of the human body, discovering how it works through complex, integrative systems built on subtle anatomical intricacies. Yet, I am drawn to how our personalities, families, past experiences, locality, culture and genes influence what we experience as health; the presence of disease, our ability to cope, our self-belief, the behaviours that we repeat and the foods that we eat. All of these facets of health across disciplines and experiences ultimately intertwine, and that is what makes health fascinating. I enjoy using my knowledge of health combined with my experiences to understand the expertise of my own body and establishing what *my* version of “normal” is. Realising my own experience of health makes me wonder about how others experience *their* normal. I love this thesis because it merges both the complexities of people and health.

However, I live in a reality where the accepted normal for women is to dislike their bodies and/or obsess about being “fit and healthy.” Many women I know – my closest friends, family, colleagues – torture their minds and their bodies about not being good enough. The belief that health, beauty, success and everything else relies on the perfect body or the perfect self is a chronic, psychological burden that often gets in the way of our own health, beauty, success, the things that we love, our potential and one of the greatest pleasures in the world – food. I have been fortunate to live in the United States, Australia and New Zealand – all beautiful countries where I have met many wonderful people. However, even though these countries fall on opposite sides of the globe, the *weight* of women’s disempowerment is the same – begrudging others, not being or doing enough “something” and incessant feelings of failure. I, of course, am not separate from this experience. I work hard to subvert such thoughts that burrow into my mind and actively redirect my focus to the many positives. I have the upper hand in doing so, as I am fortunate to “align with body standards” and am surrounded by loved ones who remind me of all my positive traits, strengths and achievements, reinforcing the belief that I am good enough. Even still, I get inklings.

I am not alone in this battle of keeping my self-belief afloat. Women are constantly bucketing these thoughts out of their minds to stay above the surface, while others can’t help but let them pour in. Not everyone experiences positive reinforcement or aligns with what is accepted by society. Women need more tools other than restrictive dieting and stressful exercise to gain control over their health and their lives to realise their greater potential. This thesis seeks to help other women find *their* normal and realise that they are good enough and capable of making positive change, while simultaneously reminding myself that I am too.

# Thesis Aim and Research Objectives

## *Thesis Aim*

The principal aim of this thesis was to develop and explore how a multidisciplinary programme can empower women over their health in a Western sociocultural context.

## *Research Objectives*

In order to address this aim, this study sought to complete the three following objectives:

1. Develop an intervention to empower women over their health that encompasses physical, mental and social dimensions and is informed by existing research.
2. Implement the programme to a group of healthy New Zealand women and evaluate the impact of the intervention in terms of its outcomes and outcome sustainability for women's health-promoting behaviours, holistic health and participants' perceived outcomes.
3. Evaluate the impact of programme implementation in terms of its reach, fidelity and participant satisfaction.
4. Identify key factors of the programme that empowered women over their holistic health.

## **Organisation of the Thesis**

The first half of the thesis establishes the groundwork for the programme. Chapter One introduces the foundational research of the thesis problem and a review is conducted in Chapter Two to inform the development of a programme to empower women over their health. Following the review, Chapter Three reports on the development and implementation of Next Level Health (NLH) to a group of healthy NZ women. Then, Chapter Four details the methods employed to evaluate NLH, which involves the assessment of women's outcomes and of the programme's delivery (process evaluation). The last half of the thesis reports on and discusses the findings of the thesis. Chapter Five disseminates the results regarding women's outcomes after participating in NLH, which are then discussed in Chapter Six. Chapter Seven reports on the results from the process evaluation. Chapter Eight integrates and discusses the findings from the process evaluation with women's outcomes and proposes key programme attributes that were fundamental to empowering women over their health. The thesis ends with a brief conclusion and proposal for future research in Chapter Nine.

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I would next like to thank ALL of my supervisors. I have learned so much from each of you and your varying academic styles and points of view. While admittedly confusing at times, it was equally rewarding to work with such a diverse team. First and foremost, I would like to thank Michelle, for prompting this journey and believing in me to the end. Thank you for always pushing me to realise my potential. Words cannot express how thankful I am for your unending guidance, patience, support, respect, friendship, life advice and love of creepy dead things you have shared with me. Eva, I cannot thank you enough for helping me find the light at the end of the tunnel this past year. It has been incredibly rewarding working alongside you no matter when, where or what we were working on. Your work ethic and simultaneous endearment for others is unmatched. Sarah, thank you for your clear-cut supervision, writing sessions, pep talks and unforgettable analogies. I have found my way through the forest and I will continue to embrace my inner Bob Ross. Rozanne and Roger, thank you for your expertise, patience, understanding and support despite incessant and unreasonable deadlines. Rachel and Jane thank you so much your support and guidance at the front end of thesis. Rachel, you have continued to support me both professionally and academically and it has made a world of difference – I cannot thank you enough. I would also like to thank my past advisors Greer and Cheleen for laying the academic foundation and research beginnings in NZ. Greer, thank you for supporting me to work towards my passions that always seem to land off the beaten track. Most of all, I am so thankful you taught me the love of surfing; it has certainly helped me get through this thesis. Shaka brah.

A massive thank you to my family and friends who were the cornerstone throughout this journey. I feel incredibly lucky to say that I was always supported and never felt alone these past four years. Mom, Dad and Wes thank you for your love and shaping me into the person I am today. I miss you every single day. Thank you so much for supporting me to do my thesis overseas and putting up with the spotty Skype connections and the prolonged absences when times became intense. Also, thank you, Dad, and Auntie Krista, for sending me love in the mailbox on a regular basis.

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# Terminology

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The terms “women” and “participants” are used interchangeably to refer to the women who participated in the Next Level Health programme.

“Programme”, “intervention”, and “Next Level Health”, “NLH” are used interchangeably to describe the six-month health programme that the 60 women participated in for the current study.

“Health practice”, “behaviours” and “lifestyle behaviours” refer to women’s daily actions for their health and wellbeing.

“Lead investigator”, “researcher”, “mentor”, “facilitator” and “V.C.” refer to the author of the thesis, unless otherwise specified.

“Health”, “wellbeing” and “holistic health” denote the same concept, unless otherwise specified.



# Abbreviations

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The following list explains abbreviations and acronyms that commonly appear throughout the thesis.

ASDAH: Association for Size Diversity and Health

BMI: Body mass index

DHWS: Defining a Health Woman Survey

HPB: Health-promoting behaviour

NZ: New Zealand

MOH: Ministry of Health

MET: Metabolic equivalent

MVPA: Moderate- to vigorous-intensity physical activity

NLH: Next Level Health

NLHQ: Next Level Health Questionnaire

NZANS: New Zealand Adult Nutrition Survey

PSQI: Pittsburgh Sleep Quality Index

QCST: Queens College Step Test

RPAQ: Recent Physical Activity Questionnaire

WCHP: Weight-centred health paradigm

WHO: World Health Organization

WHR: Waist-to-hip ratio



## *Chapter 1*

# Background

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Chapter One begins the thesis by presenting the issue of women's health in NZ and how it is predominantly promoted. The chapter then proceeds to define health within a holistic paradigm and orients this thesis alongside modern health promotion values. As such, empowerment is identified as a key approach to promote health and is thus defined and discussed. Chapter One concludes by presenting Health at Every Size as an exemplary movement of how women's health can be promoted in a positive and empowering way to support women's health in a disempowering Western sociocultural context.

## Women's Health in New Zealand

Many women experience poor health in New Zealand (NZ). For every ten NZ women, two are diagnosed with depression, bipolar and/or anxiety disorder, one reports psychological distress, five do not meet the recommended guidelines for physical activity and six do not eat the recommended fruit and vegetable intake (Ministry of Health, 2017). These rates have either worsened (i.e., mental health and fruit and vegetable intake) or have remained relatively stable (i.e., physical activity) over the past ten years (Ministry of Health, 2017). Furthermore, women are more likely to exhibit poor mental health and less likely to meet the recommended physical activity hours compared to their male counterparts (Ministry of Health, 2017). In 2013, 88% of NZ's health loss was attributable to chronic mental and physical health disorders (Ministry of Health, 2016). According to the Ministry of Health (2016), over a third of that health loss was preventable by modifying risk factors such as diet and physical activity. Yet, rates of poor mental and physical health continue to rise (Ministry of Health, 2017). Increasing rates of poor health among women not only pose concern for population health, but they place significant burden on the NZ health system (Ministry of Health, 2016; The Mental Health Commissioner, 2018).

Alongside these rates of poor health, women commonly experience body dissatisfaction in a Western sociocultural context. In contemporary society, body image and gendered ideals begin at an early age among girls, such that they are concerned with goals related to appearance and weight (Tatangelo & Ricciardelli, 2013). Fiske, Fallon, Blissmer, and Redding (2014) report on a review of prevalence studies that identify body image dissatisfaction among up to 70% of women in a Western context. Women's concerns with their bodies are often (but not exclusively) related to discontent with their body size, shape or weight, specifically the desire to be slimmer due to Western society's value of an ideal body (Cash & Pruzinsky, 1990; Grogan, 2006). In NZ, women's experience of body image concerns have been detected from pre-adolescence into late adulthood (Curtis & Loomans, 2014; Duncan, Duncan, & Schofield, 2011; Leong, Madden, Gray, & Horwath, 2013; E. Miller & Halberstadt, 2005; Talwar, Carter, & Gleaves, 2012; Wood et al., 2012). While concerns with body image tend to be more prevalent among European women, they

are becoming increasingly common among women from other cultures including Māori, Pacific and Asian (Swami et al., 2010; Talwar et al., 2012). Body image concerns among women are worrying due to their association with adverse health outcomes (e.g., depression, weight stigma, low self-esteem) and unhealthy weight-loss strategies including vomiting, dieting pills, laxatives, disordered eating patterns, binge eating, dieting, impaired sexual behaviour, compulsive exercise, physical inactivity, fasting and smoking (Carrard, Kruseman, & Marques-Vidal, 2018; Grogan, 2006; Leong et al., 2013; Mond, Hay, Rodgers, & Owen, 2012; Shagar, Harris, Boddy, & Donovan, 2017; Woertman & Van Den Brink, 2012). Thus, body image concerns negatively affect physical, mental and social dimensions of health. While body image concerns are not limited to weight, women classified over the “normal weight” classification are more likely to experience body image dissatisfaction than those who align with body mass index (BMI) standards (Carrard et al., 2018; Weinberger, Kersting, Riedel-Heller, & Luck-Sikorski, 2016). Given that a six in ten women are considered over the normal weight classification in NZ (Ministry of Health, 2017), women’s likelihood for body image dissatisfaction is concerning.

The sociocultural norms embedded in NZ lead many NZ women into a disempowering spiral of body image dissatisfaction. NZ is strongly influenced by Western values of a “thin ideal” or ideal body size, which pressures women to achieve a largely unattainable body size (Burrows, Wright, & Jungersen-Smith, 2002; Curtis & Loomans, 2014; E. Miller & Halberstadt, 2005; Paquette & Raine, 2004). In addition, the dominant weight-centred discourse in health promotion falsely reinforces the notion that body size is equitable to health status (Bacon & Aphramor, 2011; O’Hara & Taylor, 2018; Tylka et al., 2014). The emphasis placed on body weight consequently produces weight stigma, internalisation of weight bias, and victim blaming (Brewis, 2014; Rodgers, 2016; Tylka et al., 2014). In other words, hearing that being “fat” is unhealthy instils a fear of becoming fat and a belief that others who are fat are unhealthy, and choose to be so. This bias heightens women’s concerns regarding the size of their bodies and fosters unhealthy weight-control behaviours, psychosocial stress and harm to social relationships (Brewis, 2014; O’Hara & Taylor, 2018; Rodgers, 2016; Tylka et al., 2014). Internalised weight bias is not limited to women

who are overweight or obese. Leong et al. (2013) report that NZ women classified as being a healthy weight are also attempting to lose weight, which demonstrates that body image concerns are experienced by women of all sizes (Carrard et al., 2018; Curtis & Loomans, 2014; Paquette & Raine, 2004; Shagar et al., 2017). Thus, not only does the value of an ideal body instil a fear of being or becoming fat, but it can take precedence over health demonstrated by women's participation in unhealthy weight control behaviours regardless of body size (Leong et al., 2013). Popular media, the scientific community and respected health entities further reinforce women's fixation on achieving the ideal body by equating weight with health and thus contribute to women's poor health (Bacon & Aphramor, 2011; O'Hara & Taylor, 2018; Tylka et al., 2014). In sum, societal pressure to attain an ideal body leave little room for women to succeed in the current health climate; their health is equated to body size and their body size is never good enough.

Based on this evidence, it is clear that NZ women experience poor health. In addition, women often perceive their health to be equitable to body size, which has adverse consequences to mental, physical and social health dimensions. Subsequently, women experience concerning rates of poor mental health, health damaging behaviours, body dissatisfaction and disempowerment.

## **The Dominant Health Paradigm**

Current mainstream health promotion approaches predominantly concentrate on targeting risk factors and preventing disease (Baum, 2015; Hanlon, Carlisle, Hannah, Reilly, & Lyon, 2011; Taylor, O'Hara, & Barnes, 2014). A search conducted in the Scopus database revealed that the majority of articles that were published between 2008 and 2018, and were related to women's health, mentioned prevention (39,920; search: [TITLE-ABS-KEY ["women" AND "health" AND "prevent\*"]]); nearly twice the number of articles mentioning promotion (19,023; search: [TITLE-ABS-KEY ["women" AND "health" AND "promot\*"]]). Additionally, terms related to women's health promotion agendas were included in the search (search: TITLE-ABS-KEY ["women" AND "health" AND "x"]); number of published records, search terms):

- 34,579 cancer\*
- 24,554 nutrition (OR diet\*)
- 21,604 weight
- 19,682 depress\*
- 19,301 body mass index (OR BMI)
- 19,292 physical activity (OR exercise)
- 18,962 obes\*
- 17,194 diabet\*
- 16,845 quality of life
- 15,389 cardiovascular disease (OR CVD, heart disease)
- 8,164 wellbeing (OR well-being)
- 3,027 empower\*
- 1,048 holistic

While interpretation of the data above is restricted by the brevity of the search, the search results serve the current purpose by providing a rough snapshot of recently published literature that report on women's health. Many records contained terms related to illness and disease as opposed to founding health promotion values (World Health Organization, 1986), such as holistic health and empowerment. Since the end of the 20<sup>th</sup> century, health promotion has predominantly concentrated efforts on targeting risk factors and preventing disease (Baum, 2015; Hanlon et al., 2011). Yet, the Ministry of Health reports an over-reliance on the health sector as people are living longer but in poorer health (Ministry of Health, 2016). Burden on the health system is projected to increase beyond sustainable measures (The Treasury, 2013). Key health entities urge a shift towards promotion efforts that emphasise early intervention and a focus on wellbeing rather than illness to support people to live longer in good health (Ministry of Health, 2016; The Mental Health Commissioner, 2018).

The data from the search also indicate that efforts related to women's health have placed a predominant focus on obesity, weight and body size. This pattern is reflected in national (Ministry of Health, 2015) and international (Centers for Disease Control and Prevention, 2016; National Health and Medical Research Council, 2013; World Health Organization, 2004) health

recommendations that strongly encourage achieving a “healthy weight” through diet and exercise in response to the increasing rates of obesity worldwide. The predominant discourse that equates health to body weight is known as the weight-centred health paradigm (WCHP; Bacon & Aphramor, 2011; O'Hara & Taylor, 2018) or weight-normative approach (Tylka et al., 2014). A growing chorus of researchers condemn the WCHP for promoting assumptions that are inaccurate and detrimental to women’s health (Bacon & Aphramor, 2011; O'Hara & Taylor, 2018; Rodgers, 2016; Tylka et al., 2014). First, the WCHP assumes that body weight is equitable to health status, which is problematic because 1) evidence does not substantiate that overweight or obesity result in poorer life expectancy, mortality or morbidity; 2) labelling body weight as healthy or unhealthy consequently stigmatises women who are not classified as having a ‘healthy’ body weight; 3) placing body weight as health success reinforces body image concerns by vilifying weight and promoting an ideal body size (Bacon & Aphramor, 2011; O'Hara & Taylor, 2018; Rodgers, 2016). Rodgers (2016) attempts to theorise that a healthy weight discourse produces weight preoccupation and unhealthy weight-control behaviours (e.g., disordered eating patterns and compulsive physical activity) by stimulating women’s internalisation of anti-fat attitudes and beliefs about the need to control their weight. Tylka et al. (2014) further contend that the juxtaposition of “health” and “normal weight” consequently stigmatises weight. They propose a model that demonstrates how weight stigma can be internalised (irrespective of body size) that produces adverse health outcomes across the dimensions of health. Perhaps even more concerning is that health professionals also internalise weight bias, which can be a detrimental to quality of care (Paquette & Raine, 2004; Parker & Pausé, 2018; Phelan et al., 2015).

The WCHP also assumes that weight is the product of one’s own volition, specifically achieved through diet and exercise (Bacon & Aphramor, 2011). Bacon and Aphramor (2011) posit that promoting diet and exercise as a solution for obesity is an unrealistic fallacy that oversimplifies a complex issue. For instance, many other factors contribute to obesity such as social determinants (e.g., geographical location, income, accessibility) as well as one’s genetic predisposition (Swinburn & Egger, 2004). Accordingly, Bacon and Aphramor (2011) provide

evidence that weight-loss approaches are largely ineffective long-term and risk weight cycling, poor self-esteem, disordered eating and weight discrimination. Despite the widespread adoption of weight-focused approaches in public health and clinical care, the obesity rates continue to grow. Thus, there is substantial evidence to suggest that a focus on weight and weight-loss to improve health is ineffective and causes harm. In sum, the dominant health promotion discourse concentrates on preventing illness with a prominent focus on achieving a healthy weight. Yet, the results of these efforts do not concur given women's ongoing rates of women's poor health, and are likely contributing to these trends. These findings highlight a need for health promotion for women that emphasises wellbeing beyond a focus on weight.

## **What is Health?**

Health is a complex concept in the way its definition conforms to discipline and context. In the previous section, it became clear that often health definitions are shaped by the dominant discourse, currently meaning health is often seen as a visible trait manifested in people's body size. However, a comprehensive definition of health reveals its multidimensional and interconnected nature.

The biomedical model defines health as the absence of disease and has dominated health discourse through the 20<sup>th</sup> century (Foucault, 1973; Green, Tones, Cross, & Woodall, 2015; Hanlon et al., 2011). A biomedical model of health views the body as a physical machine that can be deconstructed into simpler elements to understand it as a whole such as individual organ systems or codons of DNA (Underwood, Owen, & Winkler, 1986). Such a view of health is useful in a medical setting to identify and treat the diseased. However, within a public health setting, a biomedical model is criticised for its narrow focus on the presence of illness and the passive, physical body that disregards other important aspects of health such as social, psychological, spiritual factors (Baum, 2015) and wellbeing (Antonovsky, 1979; Blaxter, 2010). Rather, a biomedical model views the mental self and the body as separate (Baum, 2015) and these are treated accordingly, as seen by the division of expertise in psychology and medicine. Yet, we are

faced with complex and chronic conditions where mental and physical ailments often co-exist and influence each other (Grace & Zondervan, 2006; Scott, Oakley Browne, McGee, & Wells, 2006). For instance, social factors such as living in an adipophobic environment and internalised weight stigma contribute to poorer physical health (O'Hara & Taylor, 2018). Moreover, predominant approaches that emphasise disease prevention are not effectively addressing modern health promotion challenges, such as declining mental health, complex chronic ailments and social health inequities (Hanlon et al., 2011). Researchers and advocates call for a new “wave” of health discourse that emphasises wellbeing, rather than disease (Hanlon et al., 2011; The Mental Health Commissioner, 2018).

Despite the notion that the biomedical model has the longest historical roots, the World Health Organization (WHO) put forward a more holistic definition of health in 1948, longstanding in the shadow of the biomedical model. Thus, 60 years ago the WHO had already defined health as, “a state of complete physical, mental and social well-being, not merely the absence of disease or infirmity” (World Health Organization, 1948). While still overshadowed by the dominance of the biomedical model, this holistic understanding is becoming increasingly more utilised in health promotion (Baum, 2015; World Health Organization, 2016).

The WHO positions health as a positive concept by placing emphasis on wellbeing. Such a positive approach avoids the risk of labelling people by their deficits and rather emphasises strengths towards developing good health (Whiting, Kendall, & Wills, 2012). This definition is also more compatible with lay definitions of health, that are context bound and often resemble a combination of physical fitness dimensions, connectedness with others, capability and psychosocial wellbeing (Blaxter, 1990, 2010). The WHO definition lends interpretation that follows the principles of self-actualisation (Maslow, 1970) such that good health is attained by the culmination of physical, mental and social wellbeing, and “being all that you can be,” (Green et al., 2015, p. 8).

Yet, the “perfect” definition is unlikely to ever exist. Practitioners continue to debate whether health should focus on wellbeing or the absence of illness (Green et al., 2015) and the

concept continues to evade consensus among researchers (Dixey, Cross, Woodall, & Foster, 2013). Critics argue that the definition positions health as a utilitarian goal that is unachievable for much of the population by labelling it as a “complete state” (Green et al., 2015; Huber et al., 2011). Others further critique that the definition fails to capture the dynamic reality of health or important aspects such as one’s spiritual wellbeing (Charlier et al., 2017). Nonetheless, the WHO definition was monumental for its time and continues to inform current health promotion practice. Holistic health as a broad concept remains the most suitable and generally agreed upon approach for promoting health as it considers the individual, their goals and their surrounding context (Tengland, 2006).

### *Holistic Health*

A holistic model of health is a multifaceted concept, in that health comprises multiple dimensions including physical, social, mental and (definition dependent) spiritual aspects (Raeburn & Rootman, 1998). Under a holistic model, the aspects of health are integrative rather than distinct; one cannot be separated from another (Tremblay & Richard, 2011). Furthermore, a holistic health paradigm embraces a salutogenic perspective which emphasises one’s resources and positive aspects of health, such as coping thus reaching beyond the absence of disease and risk factors (Antonovsky, 1979). Therefore, holistic health is a positive concept where ill-health and wellbeing may co-exist, which further distinguishes this interpretation of health from the biomedical model (Raeburn & Rootman, 1998). While holistic health is more difficult to evaluate given its breadth and complexity compared to health conceptualised as ‘the absence of illness’ (Green et al., 2015), a holistic model is advantageous for understanding complex health issues and considering a person as a whole comprising many interwoven constituents. Moreover, based on the principle of wellbeing, a holistic health paradigm is inclusive; a person diagnosed with a health disorder (e.g., diabetes, schizophrenia) may experience good health as opposed to being classified as diseased.

The physical dimension of holistic health encompasses the body's physiological responses and functioning, such as physical sensation and equilibrium of bodily systems (Laszlo, 1972). Physical health may be conceptualised as minimising illness, yet also considered as achieving physical fitness (Green et al., 2015). Green et al. (2015) elaborate that a physical dimension may include perceived physical wellbeing, such as feelings of fitness. Tengland (2006) explains that health extends beyond a "state" and thus a physical health dimension incorporates one's abilities to carry out daily tasks. The physical dimension of health can be favoured above other health dimensions in some disciplines, such as medical settings that diagnose and treat the physical body (Engel, 1989) or health promotion tactics that emphasise physical activity and healthy eating towards maintaining a healthy body (Bacon & Aphramor, 2011; Schuette, Cordero, Slosburg, Addington, & Victorson, 2017; Tylka et al., 2014). Under a holistic perspective of health, a person's physical wellbeing is not all-encompassing; one can have good quality physical wellbeing, such as optimal fitness, yet suffer poor health by diminished mental wellbeing due to experiencing extreme stress or depressive symptoms, and vice versa.

Green et al. (2015) propose an interpretation of mental wellbeing as affective and cognitive domains. The affective aspect encompasses feeling and emotion, while the cognitive considers one's desire to fulfil optimal wellbeing. The affective domain may be described as experiencing negative emotions (negative affect) or positive emotions (positive affect), which co-exist (Diener, 1993). Under a cognitive domain, optimal wellbeing may be understood as striving towards one's intellectual potential (Green et al., 2015). Researchers (Ryff, 2014; Ryff & Keyes, 1995) propose mental wellbeing as the product of six domains including autonomy, environmental mastery, personal growth, positive relations with others, purpose in life and self-acceptance. Thus, good mental health may be interpreted beyond the absence of poor mental health symptomology (e.g., depression, stress). Moreover, mental wellbeing is not simply experienced as a state (e.g., happiness, self-esteem), but it is dynamic and functional, such as the ability to cope with stressors (Tengland, 2006).

The social dimension of health is defined by one's relations to others. Social wellbeing can be viewed individually but also collectively, such as the health of a society (Green et al., 2015). Green et al. (2015) explain that at the individual level, social health may be viewed as one's independence enabled by social maturity, quality of interpersonal relationships and sense of responsibility for others. Thus, under these parameters, a person upholds good social health when they can successfully form relationships with others and their autonomy is not restricted by the upkeep of these social relations. Keyes (1998) posits that social health at the individual level depends upon both private and public domains. In a private domain, one holds personal values and personality characteristics, which are negotiated with social expectations in a public domain, such as cultural or societal values. Keyes suggests that social wellbeing at an individual level comprises five domains including social coherence, social actualisation, social integration, social contribution and social acceptance. Furthermore, Green et al. (2015) elaborate that social health can also be conceptualised in a collective sense, such as the health of a society.

Spirituality is sometimes incorporated into holistic health models as a distinct dimension typically under indigenous worldviews (Charlier et al., 2017; Durie, 1998). The spiritual dimension has been described as religious following or emotionally devout to faith, belief and hope (Green et al., 2015). Indigenous perspectives offer that spirituality is connection to or equilibrium with one's surroundings, particularly the natural environment (Charlier et al., 2017). Spirituality can offer a sense of identity and place (Durie, 1998).

While the dimensions above are described separately, they are interwoven and integrative under a holistic health perspective. "Holism describes the view that health cannot be explained simply by the sum of the parts, just as 'healthiness' cannot be explained by a list of 'risk factors'," (Blaxter, 2010, p. 18). For instance, a person's mental wellbeing relies on a sense of connectedness with others and the capacity to carry out daily tasks. Several holistic health models are presented below to aid a deeper understanding of the overarching concept.

## Te whare tapa whā

Mason Durie offers a holistic health model, te whare tapa whā (four cornerstones of health), that presents health from a Māori worldview (Durie, 1998). The model integrates four dimensions of wellbeing: taha tinana (physical health), taha hinengaro (mental health), taha whānau (social health) and taha wairua (spiritual health). The four health determinants collectively form the four walls to construct the house of health. The model emphasises the equal importance of each dimension of health, such that a deficit in one would lead to an unstable foundation. Thus, te whare tapa whā stresses the importance of balance between the integrating dimensions.

## A working model of health

Green et al. (2015) proposed a working model for health that conceptualises the interaction between the physical, social and mental dimensions of health (Figure 1).

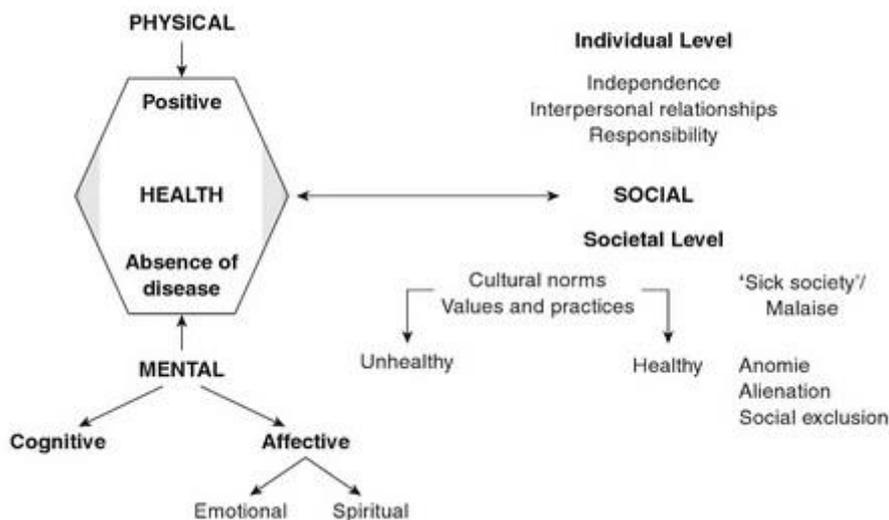


Figure 1. A working model of health (Green et al., 2015, p. 7)

The working model of health can help us to conceptualise the simultaneous experience of wellbeing (positive health aspects) and disease. Both negative and positive aspects of health fall on a continuum, such that a person can experience “negative disease states” (e.g., diabetes, schizophrenia), yet attain positive wellbeing (e.g., good social relationships, physical fitness). In

the reverse, one could also be free of disease while exhibiting poor wellbeing (e.g., poor fitness, low self-esteem). The working model encompasses spiritual wellbeing under the affective domain of one's mental wellbeing.

### **Raeburn and Rootman's quality of life model**

Given that a holistic health model comprises many elements of an individual's lived experience, it may seem all encompassing. However, health is only one aspect of a person's life and requires directed attention. Raeburn and Rootman (1998) usefully distinguish health from other domains and position holistic wellbeing as a feature of one's quality of life (Figure 2).



*Figure 2.* Holistic health as a component of quality of life (Raeburn & Rootman, 1998, p. 55)

As depicted in Figure 2, one's holistic wellbeing, which comprises social, physical, psychological and spiritual elements, contributes to a person's quality of life as part of their "being" and "belonging". However, a person's quality of life relies on other elements apart from their holistic wellbeing, such as their personal aims conceptualised as "becoming" and other facets of "belonging", such as community and ecological elements. Thus, Raeburn and Rootman's

quality of life concept offers a useful way to think about health as it centres on the *person*, such that one's health aspirations co-exist alongside other desires.

In sum, holistic health reaches beyond a biomedical paradigm by integrating physical, social, mental and sometimes spiritual dimensions as equally contributing to one's health. A holistic model is notable for its emphasis on balance and equilibrium between constituents that amass to a notion of wholeness superior to a sum of parts. Furthermore, holistic health is a positive concept and enables a salutogenic approach by its emphasis on wellbeing and recognising a wide range of influencing factors within and beyond individual control. Therefore, a holistic health perspective is well-suited to health promotion as it reaches beyond a physical paradigm defined by illness and rather considers the person as a whole emphasising the development of health across many elements. Thus, under a holistic health perspective, a healthy woman is able to maintain good wellbeing across multiple health dimensions; physically capable of daily tasks and participates in a mix of regular physical activity; mentally able to carry out daily tasks, maintain good mental wellbeing and cope with mental stressors; socially connected to her community and able to build and maintain quality relationships with others.

## **Health Promotion**

Health promotion places holistic health as a central concept to its practice and is therefore a fitting discipline for this thesis. According to the WHO (1986):

“Health promotion is the process of enabling people to increase control over, and to improve, their health. To reach a state of complete physical, mental and social well-being, an individual or group must be able to identify and to realize aspirations, to satisfy needs, and to change or cope with the environment. Health is, therefore, seen as a resource for everyday life, not the objective of living. Health is a positive concept emphasizing social and personal resources, as well

as physical capacities. Therefore, health promotion is not just the responsibility of the health sector, but goes beyond healthy life-styles to well-being” (p.1).

This definition was mandated in the Ottawa Charter, which set the groundwork for modern health promotion (World Health Organization, 1986). Taylor et al. (2014) distinguish contemporary health promotion into two approaches: traditional health promotion and modern health promotion. Traditional health promotion – which continues to dominate the health discourse – is based upon medical and behavioural principles (Baum, 2015; Taylor et al., 2014). Traditional health promotion is criticised for its narrow focus on individual behaviour change to prevent disease (Baum, 2015). Modern health promotion is distinct from traditional health promotion for its strengths-based, holistic and equity-driven approach (Taylor et al., 2014).

Modern health promotion is guided by core values established in the Ottawa Charter (Taylor et al., 2014; World Health Organization, 1986). Taylor et al. (2014) identify these values as health inequity and social justice, salutogenesis, a holistic and ecological paradigm, empowerment and participation. Within this realm, health promoting activities should be driven by these values. A value of health equity and social justice means that activities should address the health disparities that exist between groups such as for gender, ethnicity and socioeconomic status (Taylor et al., 2014). Furthermore, upholding social justice means that health promotion must be ethical and “do good by others” (Carter, 2014). A value of salutogenesis is that health promotion is a strengths-based practice that emphasises one’s wellbeing and resources (Antonovsky, 1996). A salutogenic approach supports ethical health promotion by highlighting one’s strengths as opposed to one’s deficits thus avoiding common ethical harms such as stigma and victim blaming (Carter, 2014). Health promotion should also recognise health as a holistic and complex concept that encompasses multiple dimensions, as discussed in the previous section. Finally, health promotion should be empowering by supporting people to gain greater control over their health (Laverack, 2016). In order to empower others, health promotion activities must be relevant to the people they are intended for. Hence, health promotion requires people to actively participate in the definition of activities that concern their health.

Within NZ, health promotion is also driven by its commitment to its indigenous Māori population and the upholding of the Treaty of Waitangi. The NZ health promotion competencies define whakaman (enable), hapahāpai (advocate), kōrerorero whakapiri (mediate), whakawhiti whakairo (communicate), whakatakina (lead), aro matawai (assess), whakamahere (plan), whakahāngai mahi (implement) and aromātai me nga mahi rangahau (evaluate and research) as core competencies in enabling better health for Māori (Health Promotion Forum, 2012). Thus, depending on the local context, health promotion strongly commits to upholding these competencies within the scope of practice.

### *Empowerment in Health Promotion*

Empowerment is inherent to modern health promotion, though it has roots in multiple disciplines including sociopolitical theory (Freire, 1972), health promotion and education (Labonte, 1990; Wallerstein, 1992; Wallerstein & Bernstein, 1988) and psychology (Rappaport, 1987; Zimmerman, 2000). Empowerment is a complex concept that can be understood as both a process and an aim (Tengland, 2007). Furthermore, empowerment can occur at the individual level or collectively among communities (Green et al., 2015; Labonte, 1994; Laverack & Labonte, 2000; Zimmerman, 2000; Zimmerman & Rappaport, 1988). Broadly, empowerment is conceptualised as people gaining greater control over their lives. Increased control has been described as increased competency (Labonte, 1990; Rappaport, 1987), power (Laverack, 2016; Taylor et al., 2014) and self-esteem (Zimmerman & Rappaport, 1988). Specific to health promotion, the WHO defines empowerment as enabling people to increase control over the decisions and actions that affect their health (World Health Organization, 1998). An empowerment approach is distinct in that people actively participate in the decision making process to define their goals (Tengland, 2007). Empowerment can be understood as a “bottom-up” approach that requires health entities to work with people to negotiate solutions aligned to people’s existing values and beliefs (Laverack & Labonte, 2000). However, others contend that empowerment can successfully occur from either direction – bottom-up or top-down as long as one’s existing values align with health promoting activities (Spencer, 2013). Thus, empowerment

is most centrally focused on enabling others to gain control through shared values, rather than conceptualised by the 'direction' it is achieved. The concept of empowerment differs between individual and community empowerment. However, these concepts overlap given that community empowerment involves empowered individuals with a shared goal.

Individual empowerment, also known as psychological empowerment, centres on enhancing one's personal power, such as self-confidence or self-esteem (Zimmerman & Rappaport, 1988). Self-empowerment is relatable to the psychological theory of self-actualisation such that a person realises their greater capacity or potential (Maslow, 1970). Health empowerment theory extends our understanding of individual empowerment by positioning the concept as a relational process between a person and their environment such that greater wellbeing is achieved through recognising one's personal and social-contextual resources (Shearer, 2009; Shearer & Reed, 2004). Thus, a person's achievement of their goals depends upon the interaction between one's psychological factors and their influencing environment (Shearer, 2009). Consequently, empowerment assumes that a person desires to improve their situation and that one's circumstances are conducive for their decision-making. More specifically, in order for individual empowerment to occur, a person must be motivated to seek change and their participation facilitated at the environmental level (Green et al., 2015). A person can reach a state of self-empowerment where they hold a high degree of power over their lives enabled by heightened self-esteem and capacity for life-skills that subsidize this power (Tones & Tilford, 2001). Essentially, individual empowerment amounts to a person's increased sense of control over their life. Evidence supports that individual empowerment can have a positive impact on people mental and physical wellbeing such as improvements to self-efficacy and self-esteem, sense of control, knowledge and awareness, behaviour change and connectedness with others (Wallerstein, 1992; Woodall, Raine, South, & Warwick-Booth, 2010).

Community empowerment differs from individual empowerment because it is a social-action process towards gaining greater control over the determinants that influence their lives (Wallerstein, 1992). Community empowerment often requires challenging social and political

institutions in order to obtain greater control (Wallerstein, 2006). Thus, context plays a key role in determining the efforts of community empowerment. For instance, in NZ, community empowerment may likely target issues common in a democratic, Western society such as inequities between social groups, disempowering obesity discourse and value of the thin ideal. Community empowerment in another context, such as a more oppressive society may have much different aims such as woman’s reproductive rights. Community empowerment can be conceptualised as a spectrum that increases from individual assertions to organised community efforts in an effort for people to gain greater control through social and political action (Laverack, 2016). Figure 3 depicts a model that situates individual and community empowerment in health promotion.

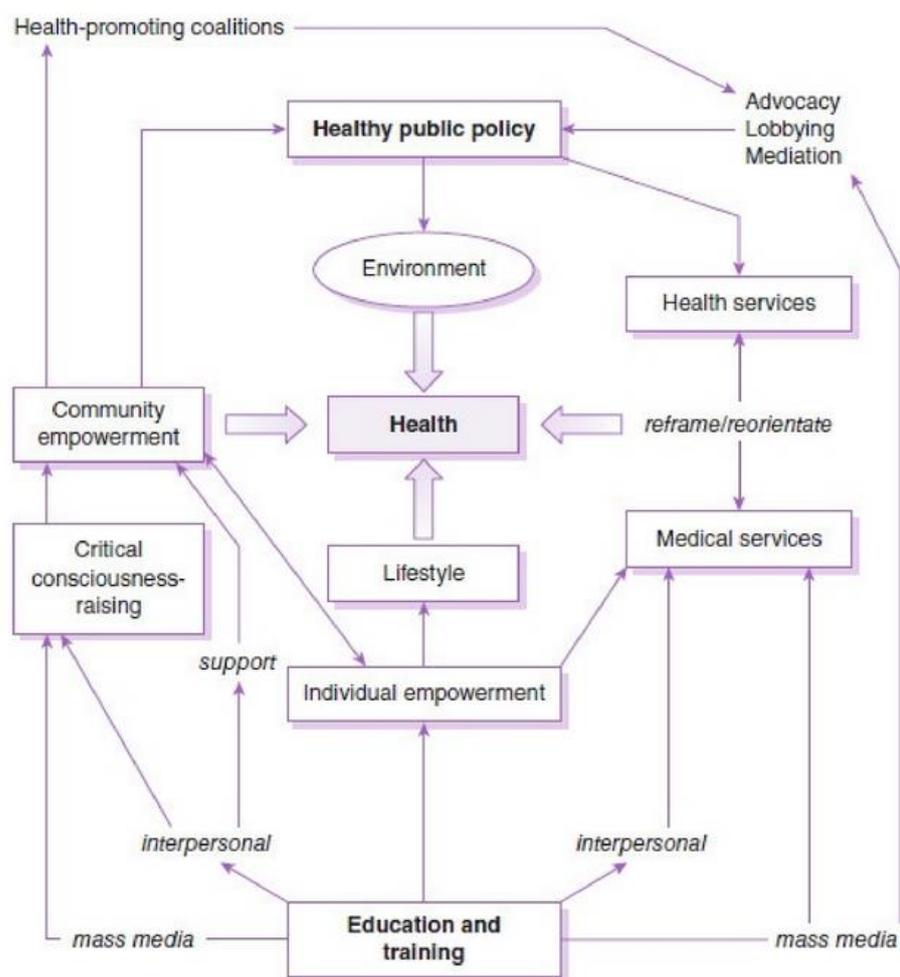


Figure 3. An empowerment model for health promotion (Greens & Tones, 2015, p. 44)

The empowerment model identifies education as a principal contributor to individual action and awareness, the building block of both individual and community empowerment. Therefore, education that is supportive of individual and community empowerment holds the potential to not only improve health outcomes at the individual and community level, but also influence healthy public policy towards much wider health impacts. The diagram also emphasises the importance of health promotion efforts directed at both the macro level via healthy public policy *and* the individual (or community) level via education and training. While both approaches are equally important, this thesis approaches empowerment in health promotion at the individual level.

Empowerment is however not without criticism. Since the concept relies on people to realise their goals and aspirations, empowerment can be a lengthy process to achieve health aims (Tengland, 2012). Additionally, facilitative methods that involve participants in the learning process require the educator to realise their own power and sacrifice a portion of their power to others (Laverack, 2016). Empowerment may also require further training for health practitioners to implement an empowering approach and understand the worldview of others in order to develop shared understanding (Tengland, 2007). Furthermore, empowerment is a difficult concept to evaluate given its complexity and varied definitions (Lindacher, Curbach, Warrelmann, Brandstetter, & Loss, 2018). However, an empowerment approach is advantageous for involving people at the heart of decision making to uphold their beliefs and values, which avoid common ethical harms such as victim blaming and stigmatisation (Tengland, 2007).

In summary, a holistic concept of health is advantageous for its ability to address complex issues yet maintain alignment with moral principles. A holistic model of health is embraced by modern health promotion, an ecological and strengths-based discipline driven by values of empowerment, social justice, participation, salutogenesis and a holistic paradigm. Health promotion positions empowerment as a necessary strategy to disseminate health work for its alignment to health promotion values and to ultimately enable people to gain greater control over their health.

## *Health at Every Size, an Exemplary Movement*

To conclude this chapter, the Health at Every Size (HAES) approach is introduced to illustrate the feasibility of, and potential for, more holistic and positive promotion for women's health. HAES is a positive, weight-inclusive approach that centres its philosophy on health as opposed to weight. The HAES movement arose partly in response to the lack of success of traditional approaches to weight management (W. Miller, 2005). HAES, founded by the Association for Size Diversity and Health, philosophises health promotion by principles of weight inclusivity, health enhancement, respectful care, eating for wellbeing and life-enhancing movement (Association for Size Diversity and Health, 2017). The HAES approach reflects values of the Ottawa Charter by using an empowerment approach and focuses on building people's holistic wellbeing regardless of their body size (O'Hara & Taylor, 2014). Furthermore, the HAES philosophy promotes body acceptance and active embodiment in alignment with a positive body image concept (Tylka & Wood-Barcalow, 2015b; Wood-Barcalow, Tylka, & Augustus-Horvath, 2010) and has been given credit for enabling an anti-stigma approach to healthcare practice (Lee & Pausé, 2016) and intervention delivery (Penney & Kirk, 2015).

The HAES movement has inspired the development of interventions based on HAES principles. Such interventions are weight-neutral and broadly promote health through “life-enhancing” physical activity, intuitive eating (eating guided by internal physiological cues), and body acceptance regardless of weight loss (Bacon & Aphramor, 2011). HAES interventions have demonstrated significant improvements to psychological distress, metabolic parameters, fitness, energy expenditure, body mass, weight maintenance, self-perception, psychological wellbeing and eating patterns (Bacon, Stern, Van Loan, & Keim, 2005; Carroll, Borkoles, & Polman, 2007; Leblanc et al., 2012). HAES interventions have also demonstrated continued improvements to psychological wellbeing and healthy eating behaviours at one-year follow up compared to traditional dieting programmes (Bacon et al., 2005; Gagnon-Girouard et al., 2010).

HAES is not without critics and its suitability has been questioned for those classified as “morbidly obese” and disregarding the importance of obesogenic environments (Penney & Kirk, 2015). However, the focus of HAES is deliberately health promotion, implying that in clinical cases other solutions may be sought if deemed appropriate. Additionally, HAES emphasises healthy eating guided towards whole foods and does not preclude any efforts to combat health-damaging, corporate food environments. Thus, HAES lends an example of positive health promotion among women in a health climate of disempowering neoliberal discourse.

In summary, NZ women experience poor health and are further disempowered by the contemporary discourse that promotes a corporeal concept of health and preventing illness. A model of holistic health was introduced that corresponds with values that underpin modern health promotion. Modern health promotion offers a positive direction for promoting health in NZ and places empowerment as a suitable approach. While central to health promotion, empowerment is an elusive and complex concept, however it essentially seeks to support people to gain greater control over their health. HAES was presented as an exemplary movement that demonstrates how health can be promoted in a positive way to support women’s health in a disempowering Western sociocultural context.



# Women's Health Empowerment Programmes – A Review

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Chapter Two presents a review of programmes that aimed to empower women in consideration of a Western sociocultural context. The chapter begins by providing rationale for the use of interventions for promoting health and the need to review women's health empowerment programmes to determine successful attributes of programme design. The review identifies five programmes reported on by 16 articles. Through thematic coding, five key programme elements and two considerations for programme evaluation are identified. Chapter Two concludes by summarising the seven key characteristics for women's health empowerment programmes.

## **Rationale for the Review**

Health promotion embraces strategies at multiple levels: individual, community and societal. Health promotion is essentially achieved by the combined approach of healthy public policy and health education (Baum, 2015; Green et al., 2015). All of these approaches are important and inter-related to improving health, which positions the promotion of health at the individual level with continued importance. While conventional health promotion has been criticised for its focus on individual behaviour change (Baum, 2015), health promotion at the individual level remains an important approach given the Ottawa Charter's ongoing relevance (Baum, 2015; Green et al., 2015; World Health Organization, 1986). Health promotion at the individual level of health promotion must work alongside community and society level approaches (Naidoo & Wills, 2016). Green et al. (2015) propose an empowerment model for health promotion, which demonstrates how health promotion at the policy level facilitates individual choice, while education and empowerment at the individual and community level contribute to development of skills and critical consciousness that enable people to shape healthy public policy (see Figure 3, p. 18). Furthermore, they describe how community empowerment and self-empowerment (individual) have a reciprocal relationship. Thus, individual health promotion via empowering education still plays a significant role in health promotion. Behavioural interventions continue to be an effective strategy for promoting health at the individual level (Baum & Fisher, 2014). In Chapter One, I examined the detrimental effects that narrowly focused health interventions can have for women. Thus, I have taken this problematic trend as a mandate to explore an approach to health interventions that embraces holistic health and empowerment as core characteristics and outcomes. While this thesis does address health improvement at the individual level, it acknowledges the importance of healthy communities and healthy public policy to work alongside contemporary behaviour interventions.

The evidence base of empowering health interventions for women is not very well established. In Chapter One, it was apparent that health promotion initiatives predominantly focus on weight management and/or preventing disease. Thus, the next step towards developing an

empowering health intervention requires identification of existing health programmes aimed at empowering women within a Western sociocultural context. This review aimed to identify these programmes, extract effective empowerment elements and establish how women's success in such programmes can be measured.

## Search Strategy

A search was conducted in PubMed, Web of Science, Scopus and Discover databases. Discover is a search engine that explores article databases with university library access such as PsycINFO, CINAHL Complete, Academic Search Premier, MEDLINE, ScienceDirect as well as other library materials. Only articles published in peer-reviewed journals were considered. Key terms included in the search were variations of: women, body image, self-acceptance, self-worth, empowerment, “health at every size”, programme, intervention, campaign and trial. More specifically, the search was conducted as follows: TITLE-ABS-KEY ((“girl\*” OR “women” OR “woman” OR “female\*”) AND (“empower\*” OR “health at every size”) AND (“body image” OR “self-acceptance” OR “self-worth” OR “self-esteem”) AND (“intervention\*” OR “program\*” OR “campaign\*” OR “trial\*”). The search was limited to English articles published in scholarly peer-reviewed journals between Jan. 2005 and Oct. 2018<sup>1</sup>. If full text was not available, the study was not considered. Search results from all databases were exported to Endnote (version X7, Thomson Reuters). Duplicate removal was achieved using Endnote. Titles and abstracts were screened for eligibility. Studies were eligible if they reported on a health intervention, empowerment as an aim or characteristic of the intervention, a non-clinical female population, promotion of wellbeing or health-promoting behaviour(s), and a Western sociocultural context. A detailed description of the search strategy as well as the study eligibility and exclusion criteria can be found in Appendix A.

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<sup>1</sup> While the initial search was conducted in 2015 before NLH, the search was revisited until 2018 to examine any new programmes. One new programme and seven publications were added to the review for completeness. These were additionally coded and integrated into the existing review. The new additions complemented existing findings and thus further strengthened the evidence that had informed Next Level Health.

If eligibility was unclear, the full text of the article was scanned for eligibility criteria. Articles stating a “Health at Every Size” approach were also considered given the alignment between the HAES principles and an empowerment approach. Reference lists from the included studies were also scanned for eligible studies. Figure 4 details the study selection process.

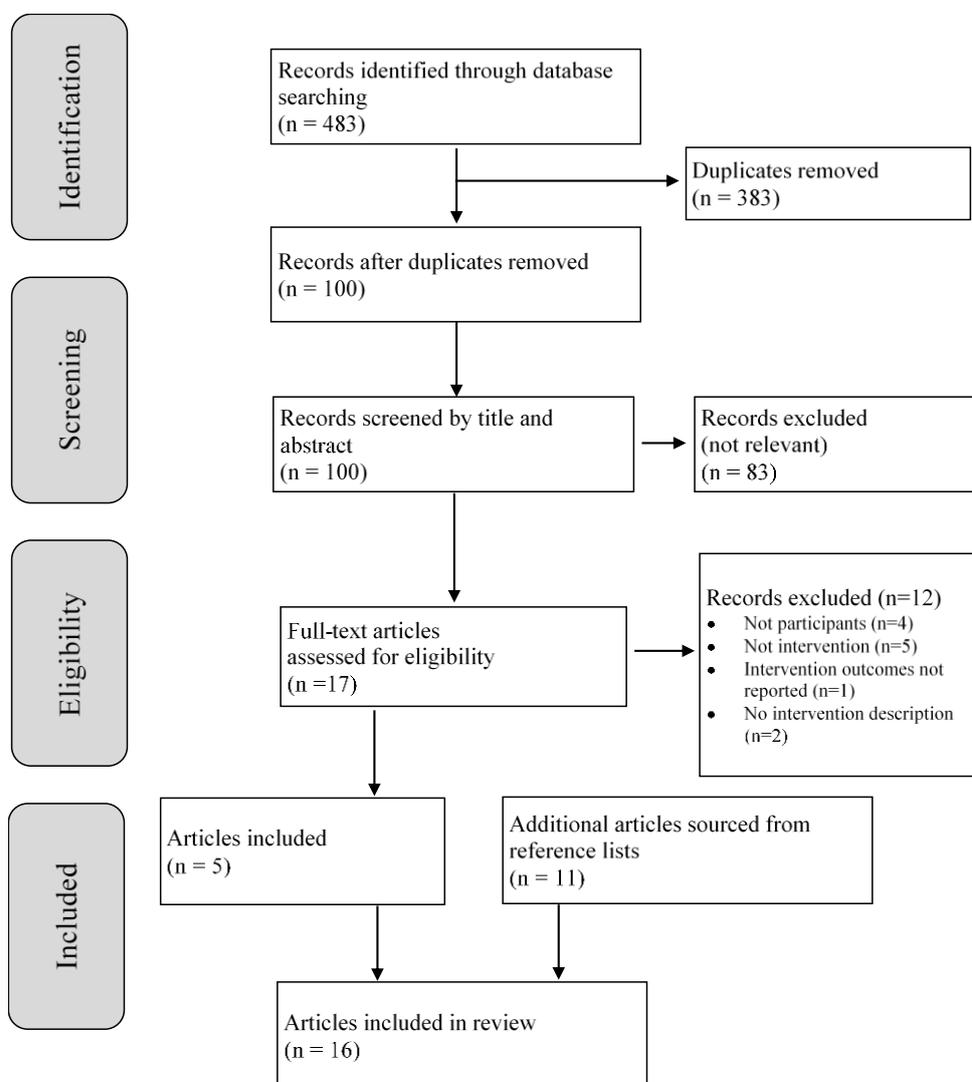


Figure 4. Selection process for articles included in this review

## Empowerment Programmes

Sixteen articles were sourced for review, however collectively these studies only included five health programmes in total summarised in Table 1 (empowerment aims and attributes) and Table 2 (programme designs and characteristics).

Table 1

*Overview of Programme Aims and Empowerment Attributes*

<b>Programme Title</b>	<b>Aims</b>	<b>Empowerment Attributes</b>	<b>Related Investigations</b>
Choisir de maigrir? (What about losing weight?)	To promote a healthy lifestyle by encouraging positive change to physical activity, eating and body acceptance	Supports personal health practices; HAES principles: weight inclusivity, health enhancement, respectful care, eating for well-being, life-enhancing movement (ASDAH, 2017)	Provencher et al., 2007, 2009 <sup>a</sup> ; Gagnon-Girouard et al., 2010; Leblanc et al., 2012; Carbonneau et al., 2017, Begin et al., 2018
HUGS (health-focused, understanding lifestyle, group supported, and self-esteem building)	To promote a healthy lifestyle by encouraging positive change to physical activity, eating and body size acceptance	Non-diet empowerment model that fosters self-empowerment within the social environment; supports personal values; HAES principles: weight inclusivity, health enhancement, respectful care, eating for well-being, life-enhancing movement (ASDAH, 2017)	Mensingher, Calogero, Stranges & Tylka, 2016; Mensinger, Calogero & Tylka, 2016; Mensinger and Meadows, 2017
Girls on the Go!	To build a group of girls' self-esteem towards improving body satisfaction, self-efficacy, nutrition and healthy lifestyle behaviours including eating and physical activity	Girls' define programme activities; collective empowerment	Tirlea et al.2013; and 2016
Stress management course	To empower a group of girls by increasing their awareness of their own thoughts and bodies.	Women's interviews inform programme content; collective empowerment; active involvement by discussion and reflection	Stromback et al., 2013; and 2016
Women Bound to be Active	To improve women's physical activity, self-efficacy and self-worth	States: "Empowering women to be more active," empowerment strategies not explicitly mentioned; active participation by group reflection and discussion	Huberty et al., 2008 and 2009 <sup>bc</sup> , 2010, 2013

Table 2

*Summary of Programme Designs and Characteristics*

<b>Programme Name</b>	<b>Investigation</b>	<b>Location</b>	<b>Programme Size (n)</b>	<b>Population of women (age)</b>	<b>Study Design</b>	<b>Intervention length</b>	<b>Number sessions/ duration/ frequency</b>	<b>Adherence at Post-intervention</b>	<b>Follow-up post-intervention</b>
Choisir de maigrir?	Carbonneau et al., 2017	Health and social service centres, Canada	216	Normal, overweight and obese (21 - 83 yrs)	RCT: Total (n = 336): intervention (n = 216), control (n = 110)	4 months	14 sessions/ 3-6hrs/ weekly	79.2%	12 months
	Provencher et al., 2007 <sup>a</sup>		48	Overweight or obese (28 - 51 yrs)	Three arm RCT; Total (n = 144): intervention (n = 48), social support (n = 48), control (n = 48)			91.7%	6 months and 12 months
HUGS	Mensingher et al., 2016	Health centre, United States	40	Physically inactive, obese women (30 - 45 yrs)	1:1 parallel group RCT; Total (n = 80): weight-neutral intervention (n = 40), weight-loss control group (n = 40)	6 months	24 sessions/ 1.5hrs/ weekly	97.5% (42.5% attended at least 2/3 of the meetings)	18 months
Girls on the Go! (Study 1)	Tirlea et al., 2013 <sup>b</sup>	Community setting, Australia	62	At-risk for poor self-esteem (13 - 16 yrs)	Stepped-wedge, Cluster RCT; group 1 (n = 31) x group 2 (n = 31)	2.5 months	10 sessions/ 1-3hrs/ weekly	95.2%	3-6 months

(Study 2)			60	At-risk for poor self-esteem (10 - 13 yrs)	Stepped-wedge, Cluster RCT; group 1 (n = 20) x group 2 (n = 20) x group 3 (n = 20)			98.4%	
Stress management course	Stromback et al., 2013 & 2016	Youth health centre, Sweden	54	Self-reported stress (17 - 25 yrs)	Pre-post, mixed-methods	Not reported	8 sessions/ 2hrs/ not reported	85.2%	No follow up
Women Bound to be Active	Huberty et al., 2010	University or community setting, United States	81	Physically inactive (Mean: 51.9 yrs [10.1])	Controlled Trial: Intervention (n = 81), control group (n = 20)	8 months	24 sessions/ 1hr/ weekly to bi-monthly	63.0%	12 months
	Huberty et al., 2008 <sup>c</sup>		45	Physically inactive, (Mean: 48.1 yrs [10.8])	Pre-post			95.6% attended at least 50% of meetings; 53.3% attended at least 75% of meetings	

*Note.* HAES = Health at Every Size, HUGS = Health-focused, Understanding lifestyle, Group supported, and Self-esteem building, RCT = Randomised-Controlled Trial

<sup>a</sup>Initial trial of "Choisir de maigrir?"; study details were the same as the subsequent trial unless otherwise noted.

<sup>b</sup>Two separate study designs reported for "Girls on the Go" within a single; study details of the two trials were the same unless otherwise noted.

<sup>c</sup>Initial trial of "Women Bound to be Active", study details of the initial trial were the same unless otherwise noted.

## *Choisir de Maigrir? (What About Losing Weight?)*

Choisir de maigrir? is a HAES intervention in that it embraced the HAES principles (see Chapter One; Provencher et al., 2007). The programme aimed to promote a healthy lifestyle by encouraging positive change to physical activity, eating and body acceptance among women. Health professionals, such as registered dietitians, clinical psychologists and/or social workers facilitated the programme, which was offered throughout the province of Quebec, Canada via a range of health and social services centres. Initially, women participating in the programme were pre-menopausal and either overweight or obese. However, subsequent versions of the programme were offered freely to any woman who desired an improved relationship with her body and eating behaviours (Carbonneau et al., 2017). The intervention was implemented in small groups of 12 women. Sessions were held weekly, each of which lasted three hours except for one intensive day session that lasted six hours. The intervention focused on promoting general wellbeing and positive ways of participating in healthy lifestyle behaviours and comprised a mix of lectures, guided self-reflection, group discussions and practical activities. These activities intended to increase women's awareness and knowledge about the myriad of factors that influence body weight, such as biological, psychological and sociocultural factors. Session themes included realistic objectives regarding weight-loss, recognition of internal and external cues to eating, external influences on eating behaviour (e.g., social interactions), physical activity and nutritious eating for enjoyment and body acceptance regarding their own and others' bodies. The intervention emphasised strengthening individual decision-making regarding health choices and focused towards long-term outcomes.

## *HUGS*

HUGS (*health-focused, understanding lifestyle, group supported, and self-esteem building*) is a weight-neutral programme that also followed the HAES principles (Mensing, Calogero, Stranges, & Tylka, 2016). A key aim of HUGS was to support participants to transition from a restrictive dieting approach to health. The programme was implemented in Pennsylvania

located in the Eastern United States. A health professional with expertise in psychotherapy and fitness led the programme, which was offered via a health centre. Women participated in a group of 20 and attended 1.5-hour sessions each week over the course of six months. HUGS recruited women who were 30-45 years old, physically inactive and classified as obese. The programme was informed by a manualised curriculum that adopted a weight-neutral approach. The programme utilised books, an educational workbook and affirmation CDs created by HUGS Inc. The curriculum guided participants to realise physical activity and healthy eating for enjoyment and wellbeing as well as recognise internal and physiological cues to moderate eating behaviour. Additionally, HUGS focused on developing women's size acceptance and encouraged long-term sustainable change. The programme offered a social support network post-intervention to foster connections and continued support between participants and facilitate sustained health changes.

### *Girls on the Go!*

Girls on the Go! was designed to address issues related to body dissatisfaction and encourage healthy lifestyles (Tirlea, Truby, & Haines, 2013). More specifically, Girls on the Go! aimed to build girls' self-esteem towards improving body satisfaction, self-efficacy, nutrition and healthy lifestyle behaviours including eating and physical activity. The programme was underpinned by holistic health values embracing the biopsychosocial model of health and empowered girls by actively involving them in activity planning. Girls on the Go! was delivered by trained facilitators and originally developed by a team of health professionals with expertise related to physical activity, social work, youth work and nursing. The programme was delivered in a culturally diverse and low socioeconomic area in Victoria, Australia and implemented through various community settings (e.g., community settings, youth agencies, local hospitals). Girls on the Go! involved girls who were referred to the programme based on poor body image, low self-esteem, physical inactivity, poor diet or not being a healthy weight. The programme occurred over a 10-week period with weekly meetings that lasted between 1-3 hours. Girls on the Go! comprised group discussion and practical activities. The themes and activities concentrated on building social

support between participants, healthy lifestyle behaviours related to physical (e.g., physical activity) and mental health (e.g., self-esteem, body image, assertiveness, stress management).

### *Stress Management Course*

The stress management course was a programme designed to support young women using a gender-sensitive perspective (Strömback, Malmgren-Olsson, & Wiklund, 2013). The course aimed to empower girls by increasing their awareness of their own thoughts and bodies through realising shared experiences with others. A team with expertise in physiotherapy, psychiatry and gender theory disseminated the course via a youth health centre in Umeå, Sweden. Girls who participated in the course were between 16-25 years and reported stress-related issues. The stress management course comprised eight sessions that each lasted about two hours. Women participated in the programme in small groups of up to 10 participants. The programme included mini-lectures or questions as discussion prompts, group discussion, paired or independent reflections, and practical activities. The group discussions related to themes identified by participants during entry interviews, such as stress, sleep, recovery, loneliness, coping and setting limits in relevance to gendered stress experienced by modern women (Wiklund, Bengs, Malmgren-Olsson, & Öhman, 2010). The practical activities consisted of body-based awareness therapy and progressive muscle relaxation therapy paired with reflection in order to develop a greater awareness of their own bodies, thoughts and experiences.

### *Women Bound to be Active*

Women Bound to be Active was a book club inspired cognitive-behavioural intervention underpinned by Social Cognitive Theory and the Transtheoretical Model. Women Bound to be Active aimed to empower women by improving their physical activity, self-efficacy and self-worth (Huberty, Vener, et al., 2008). Physical activity and health promotion students delivered the programme via several community settings (e.g., university) in Nebraska and Virginia located in the Eastern United States. Women eligible to participate in the programme were at least 19 years old and physically inactive. The intervention consisted of 24 sessions that lasted an hour for

a period of 8 months. During the first 4 months, the sessions occurred weekly and then tapered to every other week for the last four months in the aim to support independent problem solving. Women attended the sessions in groups of 20. The programme followed a syllabus, which included a workbook and readings related to the Women Bound to be Active. Additionally, women participated in reflective group discussions and practical activities. Reflective group discussion focused on readings as well as women's achievements and barriers from the previous week regarding physical activity and self-worth. Discussion themes included physical activity for enjoyment, realistic goal setting, variety of physical activity, individual physical activity preferences, needs and motivations and beliefs about themselves and their bodies. The second half of the programme familiarised women with several types of physical activity, such as walking, aerobics and circuit training.

## **Synthesising the Data**

Given the evident scarcity of women's health empowerment interventions, and the consequent lack of knowledge in this space, typical methods for synthesising intervention implementation and efficacy were not suitable (Harden et al., 2018). Furthermore, the current study sought to utilise a less time-intensive design and target a healthy group of women; the identified studies tended to target at-risk women (e.g. self-reported stress, physically inactive). Consequently, reviewing these programmes required learning in depth about how they were disseminated and evaluated given their similar aims of empowering women in a Western context. Thus, the review aimed to gain insights as to how an empowerment programme for women could be designed and assessed.

The sixteen articles were coded and thematically analysed driven by the following questions:

1. Which strategies do empowerment programmes use?
2. How do empowerment programmes measure outcomes?

Each article was coded individually line-by-line in the first round of coding. The codes were then refined and themed in the following second and third round of coding and then checked with the supervisory team for consistency of argument. Below (Figure 5) is an example of how codes collectively merged into themes.

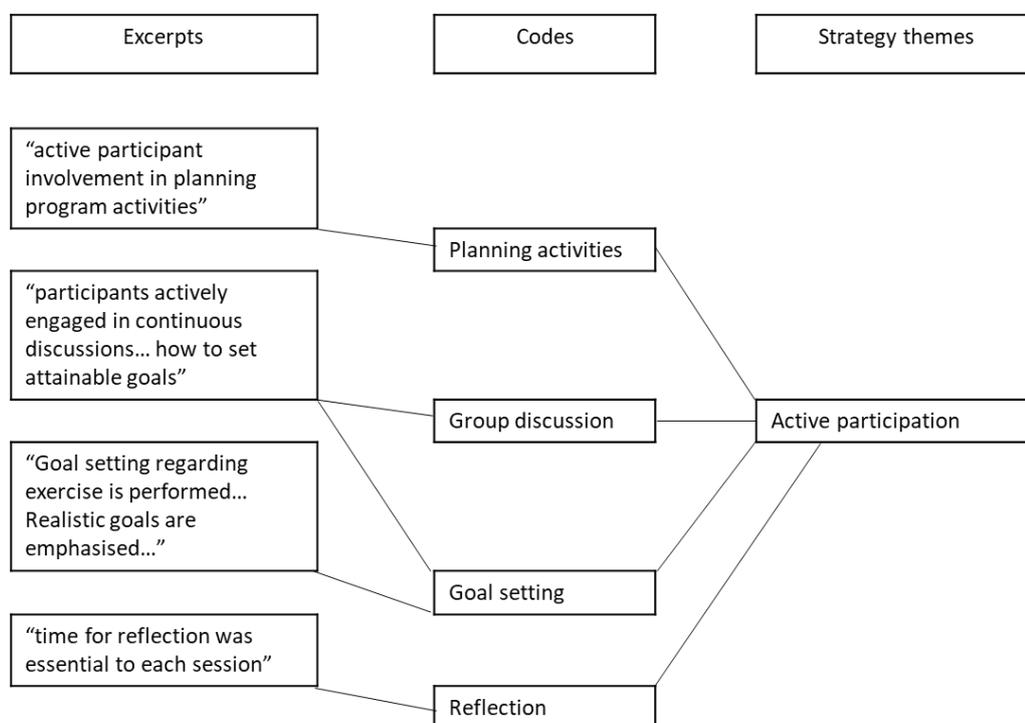


Figure 5. Thematic coding of empowerment programmes

## Programme Strategies

A summary of delivery strategies and content for each of the programmes is provided in Appendix B. Five themes were identified that the five empowerment programmes adopted to promote women’s health: (1) women’s active participation in the programme, (2) social support, (3) sustainable change, (4) holistic health perspective, and (5) weight-neutral approach.

### *Women’s Active Participation*

All of the programmes incorporated women’s active participation as a means of learning and increasing their ownership over health. Women were supported to participate in the

programme via self-reflection, group discussion, practical activities and defining health activities. Accordingly, the educators often adopted a facilitative role in order to guide participants' active learning. Encouraging women to reflect on their personal experiences in group discussions was a common approach. The majority of programmes included such reflections as a collective activity via group discussions that were prompted by either the participants or programme curriculum. The stress management course encouraged women to participate in both group and independent reflection (Strömback et al., 2013). Specifically, women reflected on their physical bodies, such as recognising hunger and satiety cues, awareness of their bodies, their responses to stress and the benefits of exercise beyond weight-loss (Huberty, Vener, et al., 2008; Mensinger, Calogero, Stranges, et al., 2016; Provencher et al., 2007; Strömback et al., 2013). Women also reflected on achievement and barriers during the programme (Huberty, Vener, et al., 2008; Tirlea et al., 2013), personalised behaviour plans (Huberty, Vener, et al., 2008; Provencher et al., 2007), and experiences of stress (Strömback et al., 2013).

Programmes also involved women in defining programme activities (Tirlea et al., 2013), discussion topics (Strömback et al., 2013) and personalised health goals (Huberty, Vener, et al., 2008; Provencher et al., 2007; Tirlea et al., 2013). Women participated in practical activities, such as group exercise (Huberty, Vener, et al., 2008; Tirlea et al., 2013), relaxation and body awareness activities (Strömback et al., 2013) and community action (Tirlea et al., 2013).

Women's active participation in the programme was mutually beneficial between the women and the programme. Participants' contributions held the potential to "contextualise" the programme by introducing their own perceptions, values and experiences. Consequently, this contextualisation fostered a connection between the participant learnings and their lived experiences. For instance, women discovered how to incorporate physical activity into their busy lives (Huberty et al., 2009) or discovered their unique experiences of stress (Strömback et al., 2013). This connection supported outcomes of self-learning, agency and empowerment at post-intervention (Strömback et al., 2013; Strömback, Wiklund, Salander Renberg, & Malmgren-Olsson, 2016).

## *Social Support*

All of the programmes were conducted in a group format, which enabled women to discuss their experiences with other women. Women's group discussions related to the themes set by the course, women's personal experiences and learnings during the programmes (Huberty, Vener, et al., 2008; Mensinger, Calogero, Stranges, et al., 2016; Provencher et al., 2007; Strömback et al., 2013; Tirlea et al., 2013). Several of the programmes fostered social connections between the participants through practical activities (Huberty et al., 2010; Huberty, Vener, et al., 2008; Strömback et al., 2013; Tirlea et al., 2013), community projects (Tirlea et al., 2013) or creating a supportive social network after the programme ended (Mensing, Calogero, Stranges, et al., 2016).

Women described how social support was motivating for long-term behavioural outcomes such as participating in physical activity (Huberty, Ehlers, Coleman, Gao, & Elavsky, 2013; Huberty et al., 2009). Women also mentioned that the social support from other women was important for being "confirmed" and thus, connected to other women (Strömback et al., 2013). Strömback et al. (2013) elaborate that recognising their stressors as shared experiences enabled them to transform their individualised experiences of stress and barriers to a collective experience. Consequently, women were empowered to prioritise their wellbeing by creating more space for themselves and challenge sociocultural pressures.

## *Sustainable change*

Another theme across the five programmes was their focus on sustainable outcomes. In particular, four programmes that concentrated on encouraging a healthy lifestyle emphasised change that was realistic, gradual and could be managed long-term (Huberty, Vener, et al., 2008; Mensinger, Calogero, Stranges, et al., 2016; Provencher et al., 2007; Tirlea et al., 2013). Two programmes explicitly stated aims of improving women's self-efficacy (Huberty, Vener, et al., 2008; Tirlea et al., 2013). One of the programmes tapered the frequency of meetings from weekly to bi-monthly in order to support women's independence for participating in physical activity

(Huberty, Vener, et al., 2008). Furthermore, the programmes often encouraged women to learn about intrinsic motivations for behaviour, such as physical activity and/or healthy eating for enjoyment (Huberty, Vener, et al., 2008; Mensinger, Calogero, Stranges, et al., 2016; Provencher et al., 2007; Tirlea et al., 2013) or managing their eating behaviours based on internal physiological cues as opposed to external factors (Mensing, Calogero, Stranges, et al., 2016; Provencher et al., 2007). Likewise, the stress management course supported women to explore their individual triggers and reactions to stress (Strömback et al., 2013). One of the programmes supported women to develop a personalised health plan tailored to their long-term intentions based on their health-related learnings after participating in the programme (Provencher et al., 2007). In addition to actively involving women in the programme, personalised goal setting was also used as a way to support women to make realistic and sustainable change. For instance, one of the programmes specified teaching women to define their own physical activity goals by exercise mode, frequency and duration, so that they were manageable for the individual participant (Huberty et al., 2010; Huberty, Vener, et al., 2008).

Consequently, women described their improved ability for goal setting at one-year post-intervention, which made them feel in control and thus empowered over their health behaviours (Huberty et al., 2009). Additionally, programmes that focused on sustainable change demonstrated significant outcomes for women's wellbeing up to one year beyond post-intervention (refer to Appendix C for details; Bégin et al., 2018; Gagnon-Girouard et al., 2010; Huberty et al., 2013; Huberty et al., 2009; Mensinger, Calogero, Stranges, et al., 2016; Mensinger, Calogero, & Tylka, 2016). These findings suggest that encouraging incremental and realistic change by strategies such as goal-setting and motivation by enjoyment or internal factors hold the potential to empower women to create sustainable health changes.

### *Holistic Health Perspective*

All of the empowerment programmes adopted a holistic perspective of health by placing emphasis on multiple dimensions of wellbeing and their interconnectivity. More specifically, all

of the programmes promoted women's mental wellbeing (e.g., fostering self-acceptance, management of stressors) and physical wellbeing (e.g., awareness of body and its internal cues, healthy eating and physical activity). Several of the programmes explicitly promoted women's social wellbeing, such as building social support, connectedness and evaluation of their existing relationships (Mensing, Calogero, Stranges, et al., 2016; Strömback et al., 2013; Tirlea et al., 2013). One programme specifically described their underpinning of a biopsychosocial model of health (Tirlea et al., 2013).

Promoting a holistic health perspective enabled women to see a broad range of benefits for participating in health behaviours, which supported women's sustainability for programme outcomes. For example, women reported continued participation in physical activity due to seeing the benefits of physical activity across multiple dimensions, such as feeling good, vitality, social support and enjoyment (Huberty et al., 2013; Huberty et al., 2009). Similarly, other programmes saw continued participation in health behaviours such as intuitive eating and physical activity (Bégin et al., 2018; Carbonneau et al., 2017; Huberty et al., 2013; Huberty et al., 2009). Additionally, Strömback et al. (2016) reported that women became "bodily empowered" by recognising internal cues and positive attributes of their bodies. Furthermore, women's increased holistic awareness of their bodies supported women to become more autonomous from disempowering sociocultural norms like dieting and body ideals (Strömback et al., 2013). Thus, a holistic perspective supported women to develop a greater understanding of themselves across multiple dimensions and participate in behaviours in a sustainable manner, which contributed to their empowerment.

### *Weight-Neutral Approach*

All of the programmes openly abstained from encouraging weight-loss or other appearance-related goals. As previously stated, women were also supported to realise benefits of health behaviours using a holistic health perspective. The programmes aimed to improve factors such as health-promoting behaviours (Huberty, Vener, et al., 2008; Mensinger, Calogero,

Stranges, et al., 2016; Provencher et al., 2007; Tirlea et al., 2013), self-esteem (Huberty, Vener, et al., 2008; Tirlea et al., 2013), awareness of self and/or body (Mensing, Calogero, Stranges, et al., 2016; Provencher et al., 2007; Strömback et al., 2013) and acceptance of self and/or body (Mensing, Calogero, Stranges, et al., 2016; Provencher et al., 2007; Strömback et al., 2013; Tirlea et al., 2013).

Huberty et al. (2009) reported that women who focused on a broad range of physical activity benefits (e.g., mental benefits, self-worth) had greater motivation for participating in physical activity compared to women who tended to focus on outcomes such as weight-loss and appearance. Likewise, women described that increased awareness of their bodies enabled women to feel more empowered and resistant to societal pressures (Strömback et al., 2013; Strömback et al., 2016).

## **Programme Evaluation**

A detailed summary of programme outcomes and associated measures can be viewed in Appendix C. Two themes arose for programme evaluation approaches: (1) Assessment of multiple health domains and (2) mixed-methods evaluation.

### *Assessment of Multiple Health Domains*

While the outcome assessments varied considerably between the interventions, programme success tended to be evaluated across multiple health dimensions including psychosocial, behavioural and physical health domains. Briefly, psychosocial outcomes included measures related to psychological wellbeing, psychological distress and self-perception. Physical assessments were either anthropometric or metabolic parameters. Behavioural evaluations concentrated on assessment related to healthy eating and physical activity. Some of the programmes also assessed behavioural determinants such as benefits and barriers to exercise. Three of the programmes (Choisir de Maigrir?, HUGS and Women Bound to be Active) assessed women's health across psychosocial, physical and behavioural parameters. Girls on the Go!

evaluated women's health success based on psychosocial and behavioural factors (Tirlea et al., 2013). While the stress management course only assessed women's outcomes under a psychosocial dimension, researchers also employed qualitative methods that provided broader evaluation of women's outcomes (Strömback et al., 2013; Strömback et al., 2016).

Assessment across multiple dimensions enabled researchers to detect a variety of ways that women exhibited health improvement (or lack thereof). For instance, sometimes women improved psychosocial and behavioural outcomes without making significant changes to physical health parameters (Bégin et al., 2018; Huberty et al., 2010). Programmes also observed women's varied change for multiple parameters within a single health domain. For instance, after participating in the HUGS programme, women improved their psychological wellbeing, but not their psychological distress (Mensing, Calogero, Stranges, et al., 2016). Evaluating multiple dimensions also aided observing changes to women's health over time. For example, women participating in Women Bound to be Active initially exhibited significant improvements to psychosocial and behavioural parameters (Huberty et al., 2010). However, at follow up, women significantly improved their behavioural and physical health factors, but no longer demonstrated significant improvements to their psychosocial health. Thus, assessment across multiple domains provided researchers a larger picture to examine women's health under a wellbeing paradigm.

### *Mixed-Methods*

Both quantitative and qualitative data were employed to evaluate programme success. All programmes were evaluated using quantitative assessments. Two of the programmes also included qualitative data thus adopting a mixed-methods approach (Huberty et al., 2013; Huberty et al., 2009; Huberty, Vener, et al., 2008; Strömback et al., 2013; Strömback et al., 2016). As above, quantitative assessments enabled researchers to detect group changes to health across multiple domains.

The programmes that employed a mixed-methods approach uncovered deeper insights as to what the women experienced as success enabled by the qualitative data. For instance, women's

responses explained their changes to health behaviour motivations, experience of barriers and perceptions of health (e.g., transitioning from an individualised to a collective view of stress). Such insights aided researchers to identify key aspects of the programme that empowered women (e.g., social support, active participation). Additionally, qualitative data enabled interpretation of the quantitative findings. For example, women who completed the stress management course exhibited increased perception of their bodies in the quantitative data (Strömback et al., 2016), while the qualitative data revealed that women had become bodily empowered by viewing their bodies as resources as opposed to a focus on deficiencies (Strömback et al., 2013). Finally, qualitative data not only helped to explain quantitative findings, but it uncovered outcomes that women experienced when significant outcomes were not captured by the quantitative measures, such as women's changes in perceptions regarding physical activity despite modest improvement to time spent being physically active (Huberty et al., 2013). Thus, both qualitative and quantitative data across multiple dimensions were equally important to assess programmes that concentrated on improving women's wellbeing under a holistic lens.

## **Discussion**

Three of the programmes (Choisir de Maigrir?, Women Bound to be Active and HUGS) have been ongoing, two of which (Choisir de Maigrir? and Women Bound to be Active) have been implemented twice and reported on. Thus, the recent trials are informed by previous programme renderings, which consequently strengthen the support for their current strategies employed. For example, subsequent iterations of Women Bound to be Active placed greater emphasis of physical activity benefits unrelated to weight loss and establishing social support. Furthermore, four of the five programmes conducted follow-up assessments post-intervention, which strengthens the findings from these programmes in terms of outcome sustainability. Three of these programmes completed follow up assessments at one year ensuing post-intervention.

This review identified very few programmes ( $n = 5$ ) that aimed to empower women in a Western sociocultural context with a focus on wellbeing. This paucity of research was recognised

by other investigators in the field (Tirlea et al., 2013). Not only were there few programmes to report on in this review, but they were highly varied based on the specificity of programme aims, samples of women studied, programme delivery and outcome assessment. Furthermore, the programmes were often vague, in particular surrounding the utility of empowerment and its evaluation. Accordingly, these factors should be considered when interpreting the findings from this review. Despite their diversity, the programmes identified reported promising outcomes for sustainable improvements to women's wellbeing at one year follow up across multiple health domains. Thus, further research to build a larger evidence base in this area is necessitated given the prevalent and increasing rates of NZ women who experience poor health and related behaviours.

Furthermore, the majority of the programmes focused on at-risk populations. As mentioned in Chapter One, health advocates urge for a shift from preventing illness to promoting wellbeing (The Mental Health Commissioner, 2018). Such a shift would involve strengthening people's health-related capacities in an effort to resist health deterioration. Thus, research is warranted to promote wellbeing among healthy populations.

Additionally, the most common delivery of the programmes required women to attend meetings on a weekly basis ranging between one and three hours. Such programme structures may be considered time-intensive, which could pose as a barrier to women's participation. In particular, women who experience time constraints might find it difficult to attend these programmes. This barrier to participation is concerning for several reasons. First, time was reported as a primary barrier to participating in health behaviours (Huberty et al., 2013). Also, researchers reported that women's experience of gendered and normalised pressures make taking time for themselves a challenge (Strömback et al., 2013). Based on these findings, it is likely that women who lack time would greatly benefit from an empowerment programme targeting wellbeing improvement. However, current programmes may be too time-intensive for these women to participate (Huberty et al., 2013). Future studies should consider structuring a programme that places lesser burden on women's time investment and greater flexibility to women's usual lives.

Another gap in the literature was the use of BMI to assess women's health. Using BMI as an assessment is a limitation because it does not account for changes in body composition (e.g., muscle tissue and adiposity). Moreover, placing body weight or body size as an outcome measure is shown to be detrimental to health and disempowering (Bacon & Aphramor, 2011; O'Hara & Taylor, 2018; Tylka et al., 2014). Furthermore, assessment of other parameters would be more appropriate to evaluate healthy populations. Future empowerment programmes should incorporate other measures to evaluate women's physical health, such as their fitness (Blair & Brodney, 1999; Warburton, Nicol, & Bredin, 2006). Such assessments would also align with a weight-neutral approach.

Of the five programmes, only two were evaluated using a mix of quantitative and qualitative data (Huberty et al., 2013; Huberty et al., 2009; Strömback et al., 2013; Strömback et al., 2016). Given the complex and holistic nature of these programmes, future studies should incorporate qualitative methods to provide a more complete picture of complex outcomes such as women's holistic health and empowerment. Likewise, only two programmes reported on the evaluation of the programme's implementation (process evaluation): the stress management course evaluated at post-intervention (Strömback et al., 2013; Strömback et al., 2016) and Women Bound to be Active surveyed at follow up one year post-intervention (Huberty et al., 2009). Future studies should report on the strengths and limitations of programme delivery to further inform successful strategies for empowerment programmes.

A further limitation is the way empowerment was inconsistently embedded in the programmes. For instance, Women Bound to be Active noted aims of empowering women, but made no explicit mention of empowerment strategies. Researchers (Wallerstein, 1992) have commented on the increasing use of the term "empowerment", which consequently dilutes the core meaning of the concept and its utilisation in programmes for that matter (Lindacher et al., 2018). Thus, clearer definition of empowerment in programmes is needed within programmes.

## Conclusion

The current review identified five empowerment programmes that aimed to improve women’s health in relevance to a Western sociocultural context. Findings from this review highlight seven key characteristics of such programmes including five programme strategies and two considerations for programme evaluation (Table 3).

Table 3

### *Seven Key Characteristics of an Empowerment Programme for Women’s Health*

Programme Characteristics	Components
<b>Strategies</b>	
Women’s active participation	<ul style="list-style-type: none"> <li>• Reflection</li> <li>• Planning health activities</li> <li>• Group discussion</li> <li>• Practical activities</li> </ul>
Social support	<ul style="list-style-type: none"> <li>• Sharing personal experiences with others</li> <li>• Group discussion</li> <li>• Building a supportive network</li> </ul>
Sustainable change	<ul style="list-style-type: none"> <li>• Self-defined goal setting</li> <li>• Emphasising intrinsic motivation</li> <li>• Support independence</li> <li>• Improve knowledge of self and body</li> </ul>
Holistic health perspective	<ul style="list-style-type: none"> <li>• Mental health Self-acceptance, stress management, self-esteem</li> <li>• Physical health Awareness of body and physiological cues, healthy eating, physical activity</li> <li>• Social health Social support, connectedness with others</li> <li>• Realise broad range of health behaviour benefits</li> </ul>
Weight-neutral approach	<ul style="list-style-type: none"> <li>• Support holistic awareness of health behaviours, motivation and body</li> <li>• Support acceptance of body/self</li> <li>• Promote positive health behaviours</li> </ul>
<b>Evaluation</b>	
Assessment of multiple health domains	<ul style="list-style-type: none"> <li>• Behavioural (healthy eating, physical activity)</li> <li>• Psychosocial (psychological wellbeing, psychological distress, self-perception)</li> <li>• Physical (anthropometric, metabolic, fitness)</li> </ul>
Mixed-methods	<ul style="list-style-type: none"> <li>• Incorporating qualitative and quantitative data to evaluate outcomes and programme delivery</li> </ul>

The reviewed programmes indicated promising outcomes for women’s long-term wellbeing across psychosocial, physical and behavioural health domains. However, existing literature for this research area is scarce. This review implores further investigation to develop an evidence-base for programmes to empower women over their health in relevance to a Western sociocultural context.

# Next Level Health - Programme Design and Delivery

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Chapter Three describes the design and implementation of Next Level Health (NLH). The development of NLH addresses the need for a multidisciplinary programme to empower women over their health in a Western sociocultural context. The five key strategies to empower women identified in Chapter Two were embedded into the design of NLH. These five strategies were: (1) women's active participation in the programme; (2) social support; (3) sustainable change; (4) holistic health perspective and (5) a weight-neutral approach. The two key considerations for programme evaluation (assessment of multiple health domains and mixed-methods design) are discussed in Chapter Four. The present chapter begins by describing the theory and values underpinning the programme and the content incorporated into NLH. Then, the chapter progresses to explain the programme's design and delivery. Chapter Three concludes with a brief summary of NLH and what its development achieves.

NLH was designed to empower women over their health. The programme emphasises enhancing women's health as opposed to a focus on preventing disease and explicitly adopts a weight-neutral approach. NLH aims to support women to realise and care for their holistic wellbeing by embedding small, positive and sustainable health changes to their existing lifestyles. The development of NLH addresses the need for a holistic, empowering and positive health promotion programme to improve women's health amidst a disempowering Western sociocultural context.

## **Underpinning Theory and Values**

Carter et al. (2011) emphasise the need for a two-pronged approach in health promotion with ethics and evidence both equally informing the design of a programme. The health promotion values support an ethical approach and are recognised by others as core components to health promotion interventions (Carter et al., 2011; Gregg & O'Hara, 2007). Thus, alongside the evidence obtained from empowerment interventions discussed in Chapter Two, NLH is informed by health promotion values and underpinned by the theory of health empowerment (Shearer, 2009).

Holistic health, participation, equity, salutogenesis and empowerment, alongside an ecological perspective of health were core health promotion values underpinning the development of NLH (Taylor et al., 2014). NLH adopted a holistic health perspective by supporting women to recognise the wider benefits of health behaviours beyond appearance or weight and by evaluating women's health under physical, mental and social health parameters. Participation was embraced by NLH through actively involving women in the programme. Accordingly, women participated in defining, evaluating and reframing their health goals throughout the programme, thus ensuring the support and integration of women's existing beliefs, values and aspirations alongside NLH aims. NLH incorporated equity by designing the programme specifically for women who experience unequal rates for poor mental health and subjectivity to body ideals as compared to men (E. Miller & Halberstadt, 2005; Ministry of Health, 2017). While the incorporation of equity in terms of socioeconomic and cultural disparities were somewhat limited, NLH did aim to

incorporate equity in the sense of enabling women with different abilities and backgrounds to participate and adjust the support and information they needed accordingly. Salutogenesis informed NLH by adopting a strengths-based approach. The programme was designed to build on and further progress women's health achievements throughout NLH, rather than highlighting deficits. An ecological perspective of health was acknowledged by recognising shared health responsibility (rather than sole individual responsibility) between the individual and their context. NLH acknowledge the interdependency between women and their family, community and societal level environments by allowing space for contextual factors to be incorporated into the programme. Collectively these values and the recognition of women as experts over their own lives laid a strong foundation for empowerment as a core value underpinning NLH in the programme design, implementation and evaluation.

Due to the elusiveness of empowerment as a concept (Lindacher et al., 2018) and its central role in the intervention, NLH was informed by the core theoretical concepts of health empowerment theory (Shearer & Reed, 2004). Within this realm, empowerment can be seen as a complex process in which human beings participate, "in a process of purposefully changing oneself and one's environment, recognizing patterns, and engaging inner resources for well-being" (Shearer & Reed, 2004, p.257). The theory assumes an interconnectedness between person and environment, making health an integral part of daily life. Therefore, empowerment is seen as a, "relational process that emerges from the recognition of personal resources and social-contextual resources" (Shearer, 2009, p.4). From an empowerment theory perspective, a person is supported to purposefully attain health goals to promote their individual wellbeing (Shearer, 2009). Thus, NLH relied on the assumptions that women would seek greater control over their health and that women's active participation in decision making would support greater control over decisions related to their health. NLH needed to be designed on the premises of supporting women to seek controllable health change in their daily lives. Such a programme would require low resourcing for participants, high adaptability, opportunities for dialogue to foster empowerment through relations and allow for context-dependent flexibility. As a result, NLH was thus designed to be

relational, contextual and participatory, yet reproducible. Figure 6 represents the theoretical model of how theory, evidence and values converge in NLH to produce women's outcomes.

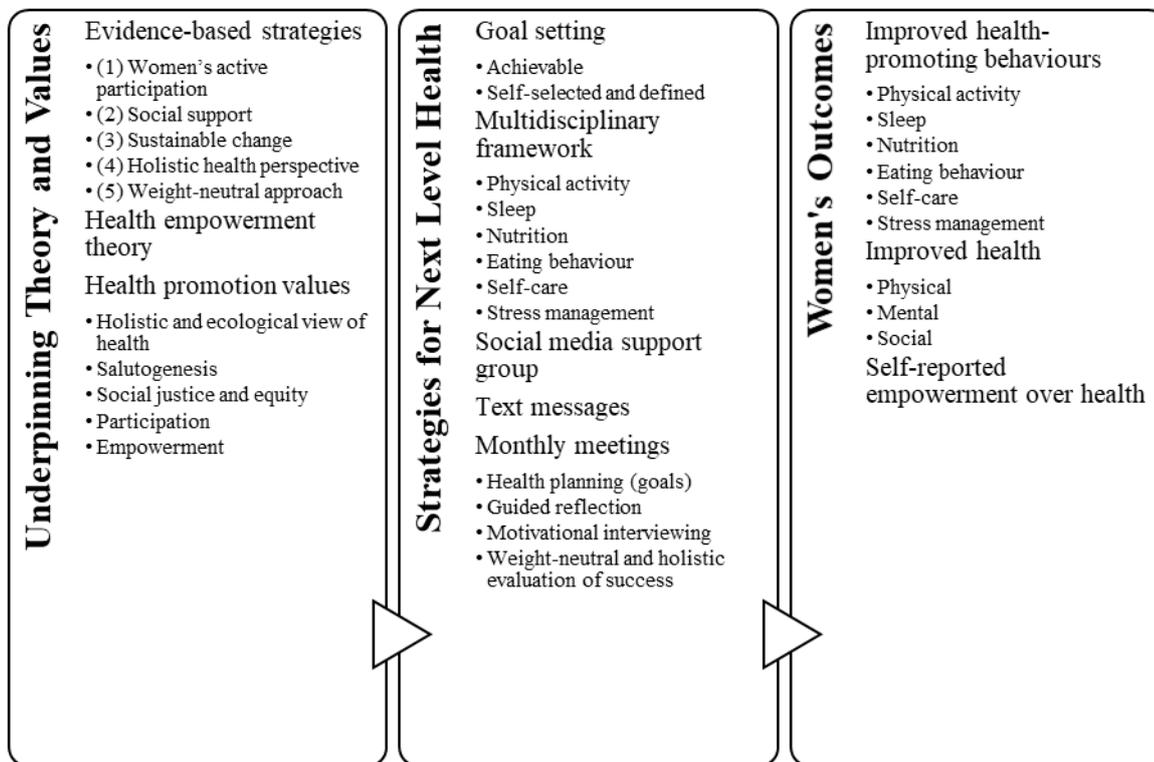


Figure 6. The theoretical model underpinning NLH

## NLH Design

NLH sought to empower women by supporting them to make incremental behaviour changes in the context of their daily lives. In order to create a sense of control, NLH emphasised making changes that were within women's own volition by building upon their existing behaviours. Furthermore, NLH supported women to make changes that were sustainable to support long-term aims. Sustainable change was a central focus of the programme; thus, women were encouraged to make changes that were achievable in a stepwise approach.

NLH adopted a strengths-based approach by emphasising the development of behaviours that were health *promoting* as opposed to an avoidance of risk. Accordingly, women were

supported to build upon their existing strengths, while the potential for stigmatising them or their participation in risk behaviours was minimised (Whiting et al., 2012). Women were actively involved throughout the process of formulating and evaluating their small goals regarding their health-promoting behaviours (HPBs).

Goal setting was utilised to encourage women's development of HPBs as it coincided with health empowerment theory given the purposeful pursuit of goals towards increased health-related achievement, and ultimately control (Latham & Locke, 1991; Shearer, 2009). Thus, women actively participated designed, planned, problem-solved and applied their health goals. NLH placed women's success on their achievement for 'small goals' related to the development of HPBs thus adopting a weight-neutral approach by not centring success on women's body size or appearance. Finally, NLH sought to empower women by integrating a holistic perspective into women's everyday health practices, meaning HPBs that were selected extended across multiple health domains.

### *Health-Promoting Behaviour Domains*

NLH adopted incremental behaviour change as a strategy for improving women's health. The underlying goal was to enable women to build a sense of control over their lives by making behaviour changes that were within their immediate control. Behaviour changes were framed as ways to support good health practices in a non-dichotomised way. That is, the aim was to abandon the idea that behaviours were dichotomised as either good or bad, as commonly perpetuated in everyday discourse (Curtis & Loomans, 2014). Given that NLH was situated in a holistic health paradigm, NLH drew from multiple health disciplines to promote a holistic perspective. Furthermore, women pursued small HPB goals simultaneously to discover their integration of health behaviours, beyond a corporeal and dichotomised conceptualisation of health.

Six health domains informed the HPBs: physical activity, sleep, nutrition, eating behaviour, self-care and stress management. Physical activity and nutrition were incorporated as key health domains given that they are well-recognised strategies for health promotion both

nationally (Ministry of Health, 2015) and internationally (World Health Organization, 2004). While physical activity and nutrition can be misused in the WCHP (Bacon & Aphramor, 2011; Tylka et al., 2014), these domains are nevertheless important for producing powerful and positive health outcomes. Eating behaviour was identified as a key health domain separate from nutrition in order to focus on the practice that influences how foods are ultimately consumed. Sleep is an often neglected, but an essential area of health (Buysse, 2014) and was thus incorporated as a key health domain for NLH. Buysse (2014) posits that sleep health is commonly addressed with curative approaches in response to the appearance of disturbance or disorder and that positive approaches to promoting good sleep health are needed. Self-care and stress management were included as key health domains to develop active coping strategies, which are recognised as key ways to support mental wellbeing (Mental Health Foundation, 2018a, 2018b). Self-care was classified as a separate domain from stress management to reach beyond the scope of managing negative stressors by promoting activities that bring joy and seek personal development (Mental Health Foundation, 2018a). The six domains collectively represented behaviours that people commonly engage with in their everyday lives. Additionally, the identified domains were also areas commonly seen as barriers to health for the NZ female population (Leong et al., 2013; E. Miller & Halberstadt, 2005; Ministry of Health, 2017; Samaranayake, Arroll, & Fernando, 2014; Wood et al., 2012). The inclusion of these domains was further supported by a cross-sectional study conducted prior to the development of NLH. The study, “Defining a Healthy Woman Survey” (DHWS), explored physical and mental health characteristics as well as health behaviours of healthy NZ women (n = 116) living in Wellington, NZ. Further details regarding the study can be found in Appendix D.

In order to create small, achievable HPB goals, each of the six health domains were deconstructed into six topics. Thus, NLH comprised six health domains and 36 total topics.

### **Physical Activity**

Physical activity was named a key health domain given its overall benefits to health (World Health Organization, 2010). Furthermore, only half of NZ women achieved the

recommended guidelines of 150 minutes of moderate- to vigorous-intensity physical activity (MVPA) per week (Ministry of Health, 2015, 2017). In contrast, findings from the DHWS indicated that 94.8% (n = 110) of the women achieved the recommended guidelines for physical activity (Appendix D). While a promising achievement rate, women may be participating in physical activity that is compulsively driven as a way to control their weight commonly detected among NZ women (Leong et al., 2013). While such approaches to physical activity behaviour seem conflicting, they both coexist with body dissatisfaction and poor mental health (Homan, 2010; Pfister, With-Nielsen, & Lenneis, 2017). Both physical inactivity and compulsive physical activity patterns detected among NZ women warrant the promotion of positive physical activity behaviour.

Thus, NLH encouraged physical activity that was positive, life-enhancing and integrated into daily life. This perspective of physical activity is embraced by the (Ministry of Health, 2015) evident by their guiding statements of “doing some physical activity is better than none” and “sit less, move more!” as well as the HAES principles of “life-enhancing movement” (Association for Size Diversity and Health, 2017). Additionally, physical activity recommendations from well-established health entities (American College of Sports Medicine, 2013; Ministry of Health, 2015) guided content of the physical activity domain in NLH. Such recommendations included participating in a varied physical activity inclusive of at least 150 minutes of aerobic MVPA, muscle strengthening at least twice per week (Ministry of Health, 2015), as well as stretching and flexibility as way to ease into activity and support joint range of motion (American College of Sports Medicine, 2013).

Accordingly, a practice of good physical activity included a varied range of physical activity that encompassed consistent stretching, muscle strengthening and aerobic activity. Increasing physical activity intensity was encouraged for added health benefits (Ministry of Health, 2015). Additionally, physical activity for enjoyment, social and functional purposes was integrated to encourage ongoing and positive participation (Homan & Tylka, 2014; Ministry of Health, 2015; Tylka & Homan, 2015; Yarwood, Carryer, & Gagan, 2005). The topics for physical

activity and muscle strengthening were broken down to focus first on frequency and then intensity. Therefore, the physical activity levels were: (1) stretching and flexibility, (2) physical activity for enjoyment, (3) muscle strengthening - frequency, (4) aerobic activity – frequency, (5) aerobic activity – intensity and (6) muscle strengthening – intensity (Table 4).

## **Sleep**

Sleep is a core part of women's daily lives that impacts on overall health, yet an area of health that receives less attention (Buysse, 2014) and was thus incorporated as a domain in NLH. Furthermore, women's experiences of poor sleep often coexist with psychological distress (Samaranayake et al., 2014; Tartar et al., 2015). Sleep is a growing public health issue across a range of population groups such as expectant and new mothers, Māori, and those of a low socioeconomic status (Paine, Gander, Harris, & Reid, 2004; Signal et al., 2007; Signal et al., 2014). Among the sample of women from the DHWS, more than half of the women (56.9%, n = 66) exhibited poor sleep, of whom reported barriers to good sleep including stress/anxiety, disturbance from their partner and environmental factors (Appendix D). Given that sleep health is influenced by modifiable environmental, social and behavioural factors (Buysse, 2014), sleep was an appropriate area for promoting women's health.

Therefore, NLH sought to support women to develop a positive health practice to promote good sleep health, which involves regularly sleeping between seven to nine hours; however, some people may sleep as few as six hours or up to ten hours (Hirshkowitz et al., 2015). Furthermore, the National Sleep Foundation (2016) recommends creating good sleep hygiene practices to support sleep health, which is achieved by winding down before bed and eliminating barriers to sleep that are environmental (e.g., lighting, temperature), consumed (e.g., caffeine, alcohol), or behavioural (e.g., working or eating in bed).

The topics in the sleep health domain thus aimed to help women establish a regular sleeping pattern and develop HPBs that supported good sleep hygiene as informed by the National Sleep Foundation (2016). Sleep domain levels began by developing a healthy sleep pattern and

wind-down routine. The topics progressed to address external sleep barriers including artificial light, diet, behaviour patterns and sleep environment. The six sleep topics were: (1) establish a regular sleep routine, (2) establish a wind down routine, (3) avoid brightly lit screens, (4) avoid sleep stealers, (5) address sleep environment and (6) aim for consistent ideal sleep (Table 4).

## **Nutrition**

Nutrition is a central component of women's daily health practices and is driven by many purposes. Nutrition is often the center of weight control practices and disordered eating patterns, which can adversely affect health (Leong, Gray, Haszard, & Horwath, 2016; Leong et al., 2013; Utter, Denny, Robinson, Ameratunga, & Crengle, 2012). Less than half of NZ women (44.5%) report consuming five serves of fruit and vegetables per day (Ministry of Health, 2017) and report inadequate intakes for calcium and iron (University of Otago & Ministry of Health, 2011). Similarly, about 57.8% (n = 66) of the women participating in the DHWS reported eating the recommended fruit and vegetable intake (Appendix D). Collectively, these findings suggest the need to promote healthy eating patterns among women.

The Ministry of Health (2015) guides healthy eating by recommending an eating pattern that incorporates a large variety of fruits and vegetables, high fibre, low saturated fat, sources of lean protein and unsaturated fat and is guided by a focus on variety and moderation. While traditionally health programmes have focused on dieting and weight-loss, NLH was committed to pursue a more flexible approach due to the negative impacts of dieting (Bacon & Aphramor, 2011; Leong et al., 2016; O'Hara & Gregg, 2010), abandon the dichotomisation of "good" and "bad" foods (Pfister et al., 2017) and enable contextual relevance.

Thus, NLH abandoned a dichotomised perspective of "good" or "bad" foods and adopted a non-dieting approach, which has shown to have a positive impact on mental wellbeing (Borkoles, Carroll, Clough, & Polman, 2016), and is thus supportive of holistic health outcomes for women. The nutrition topics included (1) increase vegetable intake and variety, (2) sodium awareness and reduction, (3) fibre, (4) fat composition, (5) reducing empty calories and moving

towards whole foods and (6) calcium and iron sources (Table 4). Alongside these topics, principles of variety, moderation and intuitive eating (eating informed by internal physiological cues to hunger and satiety) guided conversation surrounding food intake (Bacon et al., 2005; Tylka, 2006).

### **Eating Behaviour**

Eating behaviour was included as a key domain because the behaviours surrounding healthy eating ultimately influence the food that women eat. Common reported barriers to healthy eating include time, organisation, cost and ability (Murray, 2012; Warburton et al., 2006). Additionally, weight control strategies such as fasting, frequent meal skipping and disordered eating patterns are common among NZ women (Leong et al., 2016; Leong et al., 2013; Utter et al., 2012), which signals direction for health promotion efforts.

The Ministry of Health (2015) recommends regular meal preparation and water intake alongside healthy eating. Furthermore, enjoyment of food and related practices was also emphasised based on HAES principle of “eating for wellbeing” (Association for Size Diversity and Health, 2017).

Based on the issues presented, and recommendations cited, good eating behavior was defined as regular meal preparation and consumption, regular intake of water, a wide skillset for preparing meals and enjoyment for eating and preparing foods. Accordingly, the eating behaviour topics included (1) meal planning and frequency, (2) meal preparation, (3) creating and experimenting, (4) eating out – making healthy choices and reducing takeaways, (5) water intake and (6) budget (Table 4).

### **Self-care**

Self-care was included as a key health domain to support women to care for their mental health. In contemporary society, women are subject to unattainable pressures set by normative body and gendered ideals (Curtis & Loomans, 2014; E. Miller & Halberstadt, 2005; Strömback, Formark, Wiklund, & Malmgren-Olsson, 2014). The internalisation of these perceived pressures

devoid women of time for, and connectivity with, themselves (Strömback et al., 2014). To counteract these perceived pressures, good self-care was defined as the ability to be aware of, and take time for, their own needs (Strömback et al., 2014; Tylka & Wood-Barcalow, 2015b; Wood-Barcalow et al., 2010). Thus, caring for themselves required attention to whether they needed time that was shared with others for connectivity, or time that was spent solitary. Self-care encompassed participating in activities that they enjoyed, finding calm and relaxation, aligning with their personal aspirations and values and focusing on the good things in life (Mental Health Foundation, 2018a). Additionally, self-care followed the HAES principle of self-acceptance (Association for Size Diversity and Health, 2017) that was combined with self-affirmation tactics informed by the Mental Health Foundation (2018a). Thus, the self-care topics included (1) time for you, (2) personal goals/values, (3) self-appreciation, (4) relaxation, (5) personal goals/development and (6) reflection (Table 4).

### **Stress Management**

Finally, stress management was identified as a key domain to address the stressors women experienced in their daily lives. As above, women are subject to many sources of stress, and commonly present symptoms of poor mental health related to psychological distress, anxiety and depression (Melchior et al., 2007; Ministry of Health, 2017; Samaranayake et al., 2014). Among the DHWS sample, 67.2% (n = 78) reported symptoms of depression, 24.1% (n = 28) indicating moderate to severe symptoms (Appendix D). Furthermore, stress affects multiple areas of one's life, yet, the predominant discourse focuses on a corporeal notion of health with lesser focus on mental wellbeing (Burrows, 2008; Burrows et al., 2002; Pfister et al., 2017).

Therefore, alongside caring for the other five health domains, good stress management followed strategies of actively working through their stressors informed by the Mental Health Foundation (2018a, 2018b). Such active coping included recognising the causes of stressors, problem solving, focusing on the most available tasks that can be addressed, and focusing on what went well.

As a result, the stress management topics progressed through a problem-solving scheme to practice different stages of working through stressors. The stress management topics included (1) brainstorming the triggers to stress, (2) recognising what is within control, (3) managing what can't be controlled (4) acting on stressors, (5) reflecting on/in action and (6) anticipating future stressors (Table 4). Alongside the stress management topics, women were encouraged to either talk through their stressors with someone close or work through them independently depending on the stressor and what they felt comfortable with.

### *The NLH Framework*

Having holistic health at its core, the selection of HPBs in NLH needed to span across the six health domains. Thus, the six domains, goal setting and multidisciplinary aspects of the programme were embedded into a workable framework to guide women's goal setting (*Figure 7*). In order to translate the domains and topics (described above) into a framework, each health domain became a "HPB category" and the associated six topics equated to "levels" that the women could progress through during the programme. Thus, NLH offered six levels under each of the six HPB categories, totaling to 36 possible levels. The NLH framework guided women's goal setting across the six HPB categories simultaneously; women pursued six levels (one from each category) each month. Within each level were a selection of small goals that women could choose from in order to pursue that level. Thus, guided by the NLH framework, women identified six small goals from each of the categories to gradually pursue HPB changes under each domain. The majority of levels comprised a selection of four to six small goals, which varied dependent upon the level topic. Collectively, NLH provided a selection of 109 different small goals embedded in the 36 levels.

Several of the levels (sleep, level 1 and level 6; self-care, levels 1 – 6; stress management, levels 1 – 6) required a more flexible approach to tailor their goals to individual needs. In regard to these levels, the topics guided goal setting since a selection of small goals was not available (see Table 4).

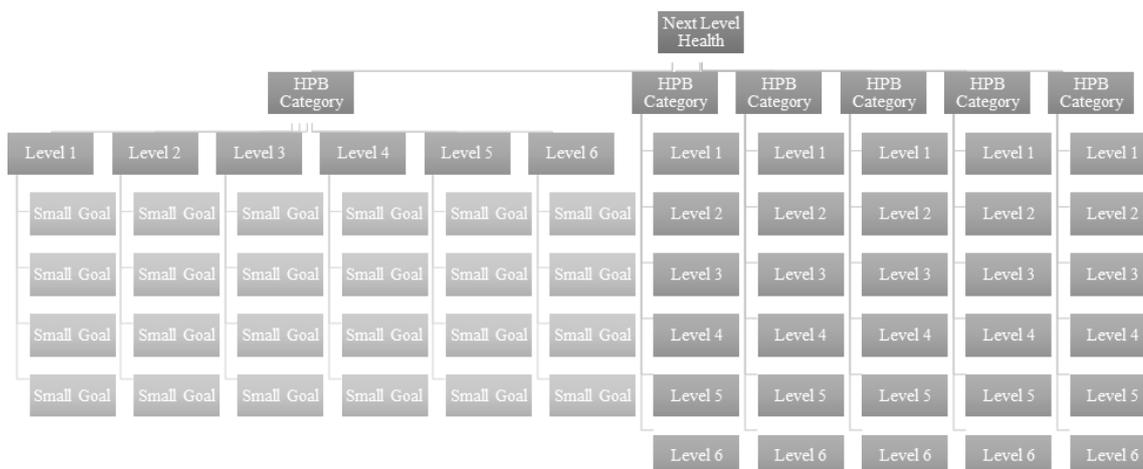


Figure 7. The NLH framework. HPB = Health-promoting behaviour.

### *Level Progression*

The six-month programme was designed for women to incrementally progress through levels within each of the HPB categories. Women set themselves weekly targets according to their selected HPB goals (see Table 4). A goal was deemed successful when women had accomplished their small goal at least three out of the four weeks. For example, if a woman achieved her stretching goal at least three of the four weeks, she completed Level 1 for physical activity. If a level was achieved, women decided whether they wanted to progress to the next level or focus on maintaining their current level to solidify that HPB. Therefore, women’s progression through NLH was self-determined upon level achievement. All women began at Level 1 for each HPB category at the start of the programme.

Table 4 details the six HPB categories, the 36 levels, the 109 small goals and the associated weekly targets.

Table 4

*Small Goals and Level Progression Within the NLH Framework*

Physical Activity			Sleep		Nutrition		Eating Behaviour		Self-care		Stress Management	
Level	Topic	Small goals	Topic	Small goals	Topic	Small goals	Topic	Small goals	Topic	Small goals	Topic	Small goals
1	Stretching and flexibility <i>At least 10 min sessions 2-4 times per week</i>	1.One muscle group 2.Two muscle groups 3.Three muscle groups 4.Four or more muscle groups	Establish a regular sleep schedule <i>4-7 nights per week</i>	Determine individual ideal sleep duration (typically 7-9 hours) to develop a realistic sleep schedule.	Increase vegetable intake and variety <i>2-4 times per week</i>	1.Add an additional vegetable to a meal 2.Trade a commonly eaten snack item for a vegetable 3.Add a vegetable to breakfast 4.Try new vegetable 5.Cook a vegetable focused meal	Meal planning and frequency <i>1-2 times per week</i>	1.Establish and replenish emergency food stores 2.Plan and shop for 3 meals/day for 2 days of the week 3.Plan and shop for 3 meals/day for 4 days of the week 4.Plan and shop for 3 meals/day for 6 days of the week 5.Eat breakfast every morning	Time for you <i>30-60 minutes per week</i>	Identify activities or a time during the week to get some personal time	Brainstorming <i>30-60 minutes per week</i>	What is triggering my stress and why?
2	Physical Activity for Fun <i>At least 10 min sessions 1-3 times per week</i>	1.Do something active you enjoy 2.Do something active with a friend or family member 3.Try something new that's active	Establish a sleep routine <i>4-7 nights per week</i>	1. Recognise three existing components of a sleep routine. 2. Establish a new routine (at least three components)	Sodium awareness and reduction <i>2-4times per week</i>	1.Look at sodium on nutrition labels 2.Consciously limit added salt 3.Use lemon juice and/or other spices in place of salt 4.Use high sodium sauces and/or dressings lightly	Meal Preparation <i>Goal specific targets</i>	1.Hide vegetables in meals for picky eaters <i>1-2 days per week</i> 2.Prepare breakfast <i>4-7 days per week</i> 3.Prepare lunch <i>4-7 days per week</i> 4.Prepare dinner <i>4-7 days per week</i>	Personal goals/values <i>30-60 minutes per week</i>	Working towards something that is important to you	Recognising what I can control <i>30-60 minutes per week</i>	What can I control in this situation?

Physical Activity			Sleep		Nutrition		Eating Behaviour		Self-care		Stress Management	
Level	Topic	Small goals	Topic	Small goals	Topic	Small goals	Level	Topic	Small goals	Topic	Small goals	Topic
3	Muscle Strengthening - Frequency <i>2-4 times per week</i>	1. One muscle group 2. Two muscle groups 3. Three muscle groups 4. Four or more muscle groups	Avoid brightly lit screens <i>4-7 nights per week</i>	1. Set electronic device(s) across the room before bed. 2. Avoid brightly lit screens 30-90min before bed. 3. Set a timeframe to avoid brightly lit screens for 30-90 min before bed (e.g., power down at 9pm and power on at 7am)	Fibre <i>2-4 times per week</i>	1. Choose a wholegrain variety of a frequently food 2. Add legumes to a meal 3. Trade a commonly eaten snack item for a fruit or vegetable 4. Fibre focused meal: must incorporate three fibre sources (e.g., wholegrains, legumes, fruit, vegetables)	Creating and experimenting <i>1-2 times per week</i>	1. Cook a new dish or experiment with a different cooking method (minor modifications okay) 2. Social cooking 3. Experiment using a new spice or herb 4. Experiment using a new vegetable or method of cooking a vegetable 5. Experiment using a new protein or method of cooking a protein 6. 'Make your own' (cook meals inspired by readymade foods at the supermarket or eating out)	Self-appreciation <i>30-60 minutes per week</i>	Combat body image dissatisfaction and develop positive self-talk to build empowerment and resilience	Managing what I can't control <i>30-60 minutes per week</i>	What is outside of my control and what are a few techniques to manage this?
4	Aerobic Activity-Frequency <i>Daily goals or weekly equivalent</i>	1. 10-15 minutes per day 2. 20-25 minutes per day 3. 30-35 minutes per day 4. 40-45 minutes per day	Sleep stealers <i>4-7 nights per week</i>	1. Avoid stimulants like caffeine and nicotine 6-12 hours before bed. 2. Avoid alcohol 3-6 hours before bed. 3. Avoid eating large meals 2-3 hours before bed. 4. Limit naps 20-30 min before during the day	Dietary Fat Composition <i>2-4 times per week</i>	1. Look at types of fat on nutrition labels 2. Reduce animal fat intake (e.g., trim fat, drain grease) 3. Eat a healthy fat source (e.g., avocado, olive oil, tuna, salmon, nuts and seeds) 4. Make your own sauce and/or dressing 5. Healthy choices around fried foods (e.g., baked/grilled options, supplement fried meal with salad/veg/fruit, eat less than normal)	Eating out: making healthy choices and reducing takeaways <i>1-2 times per week</i>	1. Choose a healthier option when eating out or buying takeaways 2. Limit eating out or takeaways to a personal goal (ex. 1-2 per week) 3. Limit eating out or takeaways to social occasions 4. Instead of eating out or buying takeaways, make your own at home	Relaxation <i>30-60 minutes per week</i>	Identify activities or a time during the week to unwind	Acting on stressors <i>30-60 minutes per week</i>	Can I do something about this now or do I give it time?

Physical Activity			Sleep		Nutrition		Eating Behaviour		Self-care		Stress Management	
Level	Topic	Small goals	Topic	Small goals	Topic	Small goals	Level	Topic	Small goals	Topic	Small goals	Topic
5	Aerobic Activity-Intensity Goal specific targets	1.Achieve MPA 2-5 days per week 2.Achieve VPA 2-5 days per week 3.Sweat and breath hard (at least MPA) 5-7 days per week 4.Meet the guidelines: 30 min MPA on 5-7 days per week or equivalent MVPA	Address sleep environment 4-7 nights per week	1. Improve light disturbance. 2. Improve noise disturbance. 3. Improve comfort disturbance. 4. Improve temperature disturbance. 5.Associate bed with sleep/sleep ritual activities	Reducing empty calories and moving towards whole foods 2-4 times per week	1.Look at sugar on nutrition labels 2.Reducing added sugar (outside of labels) 3.Use sauces and/or dressings lightly 4.Trade a commonly eaten snack item for a fruit or vegetable 5.Reduce unhealthy fat (e.g., fried food, ice cream, butter, etc.)	Water 4-7 days per week	1.Drink 2 glasses of water for every caffeinated and/or alcoholic beverage 2. Drink 1 additional glass of water by a specified time of day. 3. Drink 2 additional glasses of water by a specified time of day. 4. Drink 3 additional glasses of water by a specified time of day. 5.Drink water when eating out 6.Drink 2-2.5 litres of water 6-7 days per week	Personal development/growth 30-60 minutes per week	Identify something that makes you feel vulnerable and develop a specific goal to tackle it	Reflecting on (in)action 30-60 minutes per week	What did I learn from this experience? No dwelling, quick summaries
6	Muscle Strengthening - Intensity 2-4 times per week	1.One muscle group 2.Two muscle group 3.Three muscle groups 4.Four or more muscle groups	Aim for consistent ideal sleep hours 5-7 nights per week	No Selection	Iron and calcium 2-4 times per week	1.Eat a source of iron 2.Eat a source of calcium 3.Eat a source of iron and calcium (Bonus: at different times)	Budget 1-2 days per week	1.Work out your weekly budget. Prioritise nutritious staple foods. 2.'Make your own' (cook meals inspired by readymade foods at the supermarket or eating out). 3.Shop by specials 4.Veggie market hunt: choose a budget (e.g., \$10, \$15, \$20, \$30). Look for seasonal specials on fruits and vegetables	Reflection 30-60 minutes per week	Recognise the personal growth and positive progress you are making	Anticipating future stressors 30-60 minutes per week	How can I use previous experiences to anticipate what is coming up next?

## **Participants and Recruitment**

Women were recruited from the greater Wellington region in NZ. Women who participated in the DHWS (Appendix D) were invited to participate in NLH. DHWS participants were initially recruited via flyers posted at universities, community centres and health and fitness centres. Further recruitment strategies for NLH involved word of mouth, as interested recruits were encouraged to invite other women they knew to participate. Eligible participants were females aged 18 to 40 years, living locally and able to attend on-site meetings over the course of the intervention. Women were excluded if they were pre-menarche, menopausal, pregnant or planning to become pregnant in the upcoming year, breastfeeding, or had any illnesses (e.g., diabetes, cancer) that would interfere with their ability to participate in NLH.

## **NLH Delivery**

NLH was conducted as a six-month pilot trial to determine its feasibility among a group of healthy women living in NZ. Accordingly, the six months of the programme corresponded with the number of levels for each category in the NLH framework.

Up to this point, the content of the programme has been described, which encompasses a multidisciplinary NLH framework and goal setting strategies. Additional strategies employed to deliver NLH included monthly meetings, a social media support group and text messaging. NLH was delivered via face-to-face meetings facilitated by myself (V.C.) by supporting women to actively participate by devising and reflecting upon their goals guided by the NLH framework. The meetings were offered monthly, so that women had sufficient time to practice their small goals independently within their real-world setting between meetings. This approach intentionally aimed to build women's self-efficacy and autonomy for problem-solving, which was ultimately directed at creating sustainable change. Furthermore, meeting monthly meant that the programme was less time-intensive as compared to other empowerment programmes (Carbonneau et al., 2017;

Huberty, Vener, et al., 2008; Mensinger, Calogero, Stranges, et al., 2016; Provencher et al., 2007) and provided flexibility within women’s lives.

A social media support group was offered alongside the monthly meetings, so that women could share their experiences with the other participants throughout the duration of the programme. Finally, text messaging was also employed to send motivational messages as well as reminders for monthly meetings.

### *Monthly Meetings*

NLH comprised seven monthly meetings (Figure 8) where I met women individually to design their health plan and reflect upon their progress.



Figure 8. NLH timeline for delivery

The initial meeting occurred at 0-months (baseline) and only included goal planning for the upcoming month. Meetings 2-6 included both a reflection of women’s progress for the small goals from the previous month and goal planning for the upcoming month. The seventh meeting occurred at 6-months (post-intervention) and only included reflection on the previous month’s HPB goals.

I facilitated all of the meetings individually with each woman. The majority of meetings were conducted face-to-face in a private room at Massey University, in an effort to build rapport

between myself and each of the woman. On rare occasions, meetings were conducted over Skype (e.g., prolonged travel).

During the initial meeting, I introduced each participant to the NLH framework. The NLH framework was implemented using a excel spreadsheet (Figure 9) and displayed on a large interactive, touch screen monitor (model: PENTA-605R, AHA Inc., Korea).

Health Categories	Level 1	Level 2	Level 3	Level 4	Level 5	Level 6
Physical Activity	Flexibility	Physical activity for fun	Muscle Strengthening Frequency	Aerobic Activity Frequency	Aerobic Activity Intensity	Muscle Strengthening Intensity
Sleep	Establish a regular sleep schedule	Establish sleep ritual	Avoid bright lights	Sleep Stealers	Sleep environment	Aim for regular ideal sleep
Nutrition	Increase Vegetables	Sodium	Fibre	Fat Composition	High energy, low nutrient foods	Iron and Calcium
Eating Behaviour	Meal Planning/ Frequency	Meal Preparation	Try something new	Eating out /Takeaways	Water	Budget
Self-Care	Time for you	Personal goals/ values	Self appreciation	Relaxation	Personal Development/ Growth	Reflection
Stress Management	What is bothering me?	What can I control?	What is outside of my control?	Do something now or give it time?	What did I learn?	What's next?

**Small Goal Selection:**  
**Increase Vegetables (2-4 times per week)**

1. Add an additional vegetable to a favourite meal.
2. Trade a commonly eaten snack item for a vegetable snack.
3. Add a vegetable to breakfast.
4. Try a new vegetable.
5. Challenge: Make a mega-vegetable meal!

Figure 9. NLH displayed via excel on an interactive monitor. Wk = week.

Women were asked to choose six small goals, one from each of the six health categories. I facilitated this process by encouraging women to consider building from their current circumstances and focusing on what felt achievable to them for the upcoming month. An “achievable level” was identified by concentrating on long-term changes that women felt were manageable for the next several months to a year. Once women selected their six goals, a printed

copy of their chosen goals (see example in Appendix E) was provided that served as an overarching outline of a health plan for the upcoming month. During the meeting, women were given a period of time to independently and specifically plan how they would achieve their goals for the upcoming month roughly guided by SMART goal criteria (Bovend'Eerdt, Botell, & Wade, 2009). Women defined their small goals by brainstorming on a printout worksheet (Appendix F). Once a participant had formulated the basis of their health plan, they discussed their plans with me and I provided feedback as needed by prompting for goal specificity, education (e.g., nutritional advice) and ideas for activities. For example, when women chose small goals that focused on nutrition labels (e.g., looking at fibre, added sugar, type of fats or sodium), I guided them through a nutrition label example where women could ask questions as needed. Women also discussed ideas with me when they became short on ideas on how to approach their goals. For instance, if a woman was seeking ideas on how to incorporate sources of unsaturated fats, I would offer examples such as olive oil, (canned) fish, seeds, etc. to get them started as needed. For guidance in stress management, women were asked to either provide an example of a current personal stressor they were experiencing and I guided them through how to explore the stress management questions (e.g., What's bothering me and why? What can I control? What is out of my control? What can I do to take action and what do I need to?). In some cases, women either could not think of an example or felt uncomfortable sharing their stressor, so I provided an example to work through.

I facilitated discussion with women regarding their progression, achievements, barriers and new HPBs during the review phase their monthly meetings (meetings 2-7). Discussion was guided by a holistic perspective, strengths-based approach (Antonovsky, 1996) and aspects of motivational interviewing (W. Miller & Rollnick, 1991). While the small goals defined the criteria for goal achievement, women's progress was further evaluated by the benefits they experienced as they progressed through the programme using a weight-neutral and holistic lens. For instance, if a woman was focusing on a small goal regarding aerobic activity, I prompted her to explore the benefits she experienced, whether or not the goals were achieved. Furthermore, I participated in a

training workshop for motivational interviewing, which supported me to approach all discussions with a positive and accepting attitude by actively listening and showing empathy to build a good rapport with participants, facilitate open-ended discussions, problem solve health challenges and aid adherence (Hetteema, Steele, & Miller, 2005). Women were also encouraged to integrate their goals following a holistic health perspective as they advanced through NLH. For example, a session of yoga could encompass multiple physical activity HPB goals (i.e. stretching and flexibility, muscle strengthening, aerobic activity and physical activity for enjoyment as applicable). Goals from “separate” HPB categories could also be simultaneously achieved. For instance, participating in a period of enjoyable movement could incorporate goals from physical activity and self-care HPB categories. I recorded notes of each participant’s specific HPB plan to refer to in their following monthly meeting. Women were provided weekly checklists to independently track the achievement for goals between the monthly meetings (Appendix G).

In the first six meetings, women played an active role in selecting their small goals and defining goal specificity and intensity relating to their current circumstances. If women achieved their goals, they decided whether to progress to the next level or remain at their current level to reinforce the former HPB goal and associated HPB. If a goal was not achieved, women were asked to either revise their current goal or select a different small goal from the same topic. Women were encouraged to adapt and revise their goals independently if they experienced difficulty with a goal they had set or encountered unexpected circumstances between monthly meetings.

### *Motivational and Reminder Text Messages*

I communicated with the women via texting to remind them of scheduled appointments unless otherwise requested. Additionally, a text message was sent to each woman between monthly meetings. The mid-monthly text messages contained motivational messages to provide encouragement and further reinforcement of programme by reminding women of their goals Torres et al. (2016). All women received the same mid-monthly message, which contained a different message for each month (Appendix H).

## *Social Media Support Group*

All participants were invited to join a private Facebook group which served as both a supportive community and resource for information related to the NLH philosophy. Facebook was chosen as the preferred social media site given that existing popular social media networks demonstrate better outcomes for engagement and adherence compared to newly developed sites (Maher et al., 2014). Delivery of the group component via a social media site was convenient in that women could access the support group at any time, thus overcoming barriers to participant attendance, such as scheduling group meetings (Torres et al., 2016).

Additionally, two of my supervisors and I joined the social media group to observe and/or manage the site. I hosted the site with one of my supervisors and we both shared educational and inspirational posts. The women from the NLH community and I posted real-life examples of small goals, goal accomplishments and barriers that were encountered throughout the programme. Women were also invited to share ideas related to small goals such as local activities (e.g., koha yoga classes, walking tracks) and related information (e.g., healthy recipes, activities, reflection prompts). Thus, the online support group provided a safe and collective space for NLH members to conveniently interact, share progress, provide encouragement and reach out for support.

## **Summary**

In sum, NLH was specifically designed to empower women over their holistic health. NLH was underpinned by values of evidence and ethics. More specifically, NLH was driven by health empowerment theory, health promotion values and five key strategies utilised by empowerment programmes identified in Chapter Two. An emphasis was placed on working from women's existing circumstances towards realistic and sustainable changes to HPBs. The programme employed a multidisciplinary framework that comprises six HPB categories: physical activity, sleep, nutrition, eating behaviour, self-care and stress management. Thus, the framework embedded a holistic health perspective through the simultaneous pursuit of small HPB goals

across multiple health domains. Furthermore, the NLH framework was intentionally designed to be adaptable to women's individual context, such that women selected, defined, designed, reframed and reflected on small goals that were relevant to them. Programme flexibility was further aided by the pursuit of goals across multiple health domains, women's self-determined progression through the levels and access to social support via social media. NLH also offered social support in the form of monthly meetings and I adopted a strengths-based approach to provide positive reinforcement and guided health achievement under a holistic, ecological and weight-neutral lens. Thus, NLH involved women to actively participate at every step including the formulation of their health plans, determination of their progress, independent pursuit of small goals, interaction with other participants via the social media support group and through dialogue with their facilitator reflecting upon their progress and barriers each month. Overall, NLH offers a convenient and adaptable design to promote women's health in a positive, empowering and holistic way. The NLH approach ultimately aims to broaden women's approach to health beyond a corporeal paradigm and thus empower them to gain greater control over their health within a disempowering Western sociocultural context.



## *Chapter 4*

# NLH Evaluation Methods, Materials and Analysis

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In the last chapter, I described the design and implementation of NLH. Chapter Four progresses to clarify how NLH was evaluated. Informed by the evidence from previous empowerment programmes discussed in Chapter Two, the current study adopted a mixed-methods design and assessment across multiple health dimensions in order to evaluate NLH. Outcome evaluation included assessment of women's HPBs, health (physical, mental and social dimensions) and qualitative assessment of women's perceived outcomes. Additionally, programme implementation was evaluated (process evaluation), which included quantitative and qualitative assessment of the programme's reach, fidelity and participant satisfaction. Chapter Four first describes and provides rationale for the study design including the paradigm, theoretical lens, methodological approach and methods of data collection (Cresswell & Plano Clark, 2018; Crotty, 1998). Thereafter, I outline the data analysis procedures and data validity. The chapter closes with a brief overview of ethical considerations upheld by the study.

## Worldview of Pragmatism

A worldview of pragmatism guided the approach to, and interpretation of, the thesis. Pragmatism is commonly adopted in mixed-methods research (Tashakkori & Teddlie, 2003) and prioritises the research questions asked over the methods employed (Cresswell & Plano Clark, 2018). Hence, pragmatism is a problem-centred approach that concentrates on the consequences of research and combines multiple methods in order to answer the questions sought (Cresswell & Plano Clark, 2018). Thus, all four research objectives were the primary drivers for the thesis and evaluated through the integration of both quantitative and qualitative data. Since the underlying aim of the programme was to empower women over their health, health empowerment theory guided interpretation of the results. Thus, interpretation of this thesis assumed the relational interaction between individual and environment and that women purposively sought personal development under supportive circumstances towards enhancing their health (Shearer, 2009; Shearer & Reed, 2004).

## Mixed-Methods Design

A convergent mixed-methods design guided the evaluation of NLH. In a convergent model, the quantitative and qualitative data are separately (but concurrently) collected and analysed, then the data are combined for the interpretation and discussion of results (Figure 10).

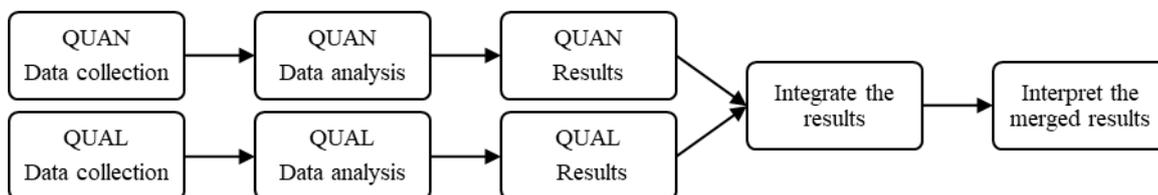


Figure 10. A model of the convergent mixed-methods design (adapted from Cresswell & Plano Clark, 2018)

This design enabled a more comprehensive picture of the data by uniting the strengths of both quantitative and qualitative methods (Cresswell & Plano Clark, 2018). Furthermore, combining the two data types on one phenomenon of interest offered a form of data validation (Cresswell & Plano Clark, 2018). The quantitative data enabled observation of patterns that occurred across the research sample at different time points, while the qualitative data provided insight as to why the changes were observed and unveiled context specific information. There are no set standards to evaluate empowerment programmes due to the role of context, though a mixed-methods design is commonly employed (Lindacher et al., 2018). Qualitative data was further necessitated to provide deeper interpretation of the holistic and multidisciplinary aspects of NLH and explore effective and ineffective aspects of the programme's implementation to inform future iterations.

## **Data Collection Procedures**

The principal aim of this thesis was to develop and explore how a multidisciplinary programme can empower women over their health in a Western sociocultural context. Thus, the research objectives were:

1. Develop an intervention to empower women over their health that encompasses physical, mental and social dimensions and is informed by existing research.
2. Implement the programme to a group of healthy New Zealand women and evaluate the impact of the intervention in terms of its outcomes and outcome sustainability for women's health-promoting behaviours, holistic health and participants' perceived outcomes.
3. Evaluate the impact of programme implementation in terms of its reach, fidelity and participant satisfaction.
4. Identify key factors of the programme that empowered women over their holistic health.

The development of NLH was achieved as described in Chapter Three (objective 1). Thus, data were collected to evaluate the programme based on women’s outcomes after participating in NLH (research objective 2) and programme implementation (research objective 3), which would collectively inform key factors that contributed to women’s empowerment over their holistic health (research objective 4).

Following the mixed-methods convergent design, quantitative and qualitative data were collected separately, yet simultaneously. Figure 11 outlines the outcome assessments that occurred during the initial meeting at 0 months (baseline) and again at 6 months (post-intervention). Women also completed outcome assessments at 12 months, six months following post-intervention (follow up). Data for process evaluation were collected throughout the implementation of NLH. The women also completed evaluation forms at post-intervention and follow up to provide additional data regarding both process and outcome evaluation.

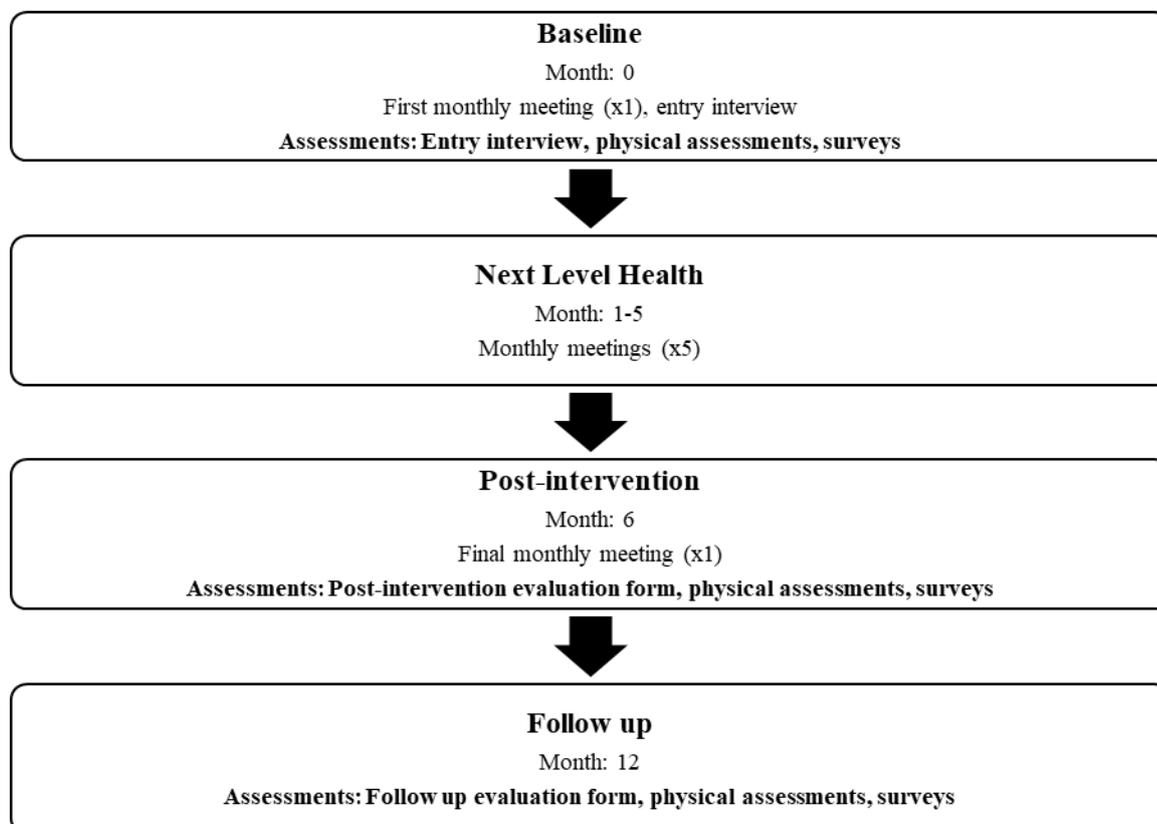


Figure 11. NLH assessments at baseline, post-intervention and follow up.

The assessments and monthly meetings were conducted on-site at Massey University in Wellington, NZ. The following paragraphs briefly summarise each type of assessment. A detailed description of women's outcomes and process evaluation are then described in the next section.

***Entry interviews.*** At the start of the baseline meeting, women participated in a brief, open-ended interview. Interviews were conducted face-to-face between myself and each participant in a private room. Women were asked why they had decided to participate in NLH. Interviews were recorded using a smartphone application (Supernote, Fitness22 Ltd).

***Physical assessments.*** As part of the outcomes, women participated in physical assessments including anthropometric measures and a step test at baseline, post-intervention and follow up. The step test, height and weight were measured in a shared laboratory space. Women were explicitly informed that weight and height were assessed for descriptive purposes as part of the research study and were unrelated to outcomes for the programme. Further precautions were taken to uphold an ethical practice, which can be found detailed in the ethical considerations section at the end of the chapter. Women were instructed to avoid strenuous activity within 24 hours and not consume caffeine within five hours prior to testing to ensure the results (i.e., heart rate) were not influenced by external factors.

***Surveys.*** The majority of data were collected via surveys at baseline, post-intervention and follow up. The surveys included a series of validated questionnaires: Recent Physical Activity Questionnaire (RPAQ; Appendix I; Besson, Brage, Jakes, Ekelund, & Wareham, 2010); Pittsburgh Sleep Quality Index (PSQI; Appendix J; Buysse, Reynolds III, Monk, Berman, & Kupfer, 1989); Brief Resilience Scale (Appendix K; Smith et al., 2008); Flourishing Scale (Appendix L; Diener et al., 2009); Subjective Happiness Scale (Appendix M; Lyubomirsky & Lepper, 1999); 21-Item version of the Depression, Anxiety and Stress Scale (DASS-21; Appendix N; Lovibond & Lovibond, 1995) and Figure Rating Scale (Appendix O; Pulvers et al., 2004). Each survey is described at greater depth as the associated outcome is presented.

Additionally, the Next Level Health Questionnaire (NLHQ; Appendix P) was designed to capture items specifically relevant to NLH. The NLHQ comprised items that assessed women's HPBs and aspects of women's health outcomes under psychological empowerment, self-perception and social health. The NLHQ contained questions specific to the HPBs that were primarily designed according to the NLH framework. Items were also adapted from previously validated surveys and integrated into the NLHQ as opposed to the full questionnaires in an effort to attenuate participant burden. Questions from the New Zealand Adult Nutrition Survey (Ministry of Health, 2008) informed the majority of items regarding the nutrition HPBs. As part of the assessment for psychological empowerment, two questions were derived from the Internal Health Locus of Control scale (Wallston, Strudler Wallston, & DeVellis, 1978). To evaluate the positive aspects of self-perception, two items were derived from the Body Appreciation Scale-2 (Tylka & Wood-Barcalow, 2015a) and integrated into the NLHQ to assess body comfort and confidence in support of a strengths-based approach. The social health questions were items adapted from the UCLA Loneliness Scale (Russell, Peplau, & Cutrona, 1980).

The surveys were implemented via an online questionnaire platform (Qualtrics.com). Women completed the questionnaires on-site in a private room using a portable laptop computer. While women completed the surveys, I was available to answer questions, but was not present in the room. In the case of distance responses (n = 5) at follow up, women were sent links to access the online surveys via email. Collectively, the surveys took about 45 to 60 minutes to complete.

*NLH evaluation forms.* Women completed two evaluation forms for NLH: one at post-intervention (Appendix Q) and one follow up (Appendix R). The evaluation forms were completed at the very start of the session prior to any other assessments or conversing with me so as not to influence women's responses. The evaluation forms were specifically designed to collect data for both outcome and process evaluation data and were filled out by hand.

## Outcome Evaluation

The key aim of NLH was to empower women over their holistic wellbeing by developing a broad range of HPBs. Hence, women’s HPBs were a key aspect of evaluating NLH outcomes. Elements of women’s physical, mental and social health also informed outcome evaluation to determine if women experienced positive changes to their health after participating in NLH. Additionally, qualitative data were collected regarding women’s perceived outcomes, which enabled deeper assessment of empowerment (Lindacher et al., 2018). Thus, the data collected to evaluate NLH outcomes assessed women’s HPBs, health outcomes and participant perceived outcomes.

### *HPB Outcomes*

The 31 HPBs related to the NLH framework goals determined women’s HPB outcomes. All HPBs were assessed using the NLHQ unless otherwise specified. For each woman, all HPBs were assessed as “achieved” or “not achieved.” Thus, each woman could achieve up to 31 HPBs at each time point. Definition and achievement criteria for the 31 HPBs are listed in Table 5. The 31 HPBs were associated with the six HPB categories: physical activity (n = 3), sleep (n = 6), nutrition (n = 10), eating behaviour (n = 5), self-care (n = 4) and stress management (n = 3). Achievement of most HPBs were assessed using the NLHQ. HPBs related to aerobic activity and sleep duration were assessed using the RPAQ and PSQI respectively.

Table 5

#### *The 31 HPBs and Their Achievement Criteria*

Category	Health-Promoting Behaviour	Achievement Criteria
PA	Aerobic	At least 150 minutes of moderate-to-vigorous physical activity per week.
PA	Muscle strengthening	Exercise sessions (minimum 10 minutes) on at least one to two days per week
PA	Stretching	Exercise sessions (minimum 10 minutes) on at least one to two days per week

SL	Sleeping the recommended hours	At least 7 hours for the majority of nights in the past month.
SL	Consistent sleep/wake times	At least three to four nights per week.
SL	Wind-down routine	At least three to four nights per week.
SL	Limiting screen time	At least 30 minutes before sleep on an average night.
SL	Avoiding sleep stealers	Less than three nights per week (alcohol, caffeine, naps and sugar).
SL	Limits eating and working in bed	Less than three nights per week.
NU	Vegetables	At least three serves per day.
NU	Fruit	At least two serves per day.
NU	Limiting sodium sources	Reports “sometimes” or less for both salt and soy sauce.
NU	Fibre sources	At least two of the following: fruit and vegetables (five servings or more), legumes (at least three times per week) or choosing wholegrain varieties (“often” or more)
NU	Healthy fat sources	At least two of the following: plant-based cooking oil; fish intake at least one to two times per week; or intake of nuts and seeds reported as “often” or more.
NU	Limiting less healthy fat sources	No more than one of the following: fried fish, chips, takeaways more than two times per week each and animal-based cooking fat.
NU	Limiting added sugar sources	No more than one of the following: lollies, fizzy drinks, fruit juices, energy drinks and alcohol less than three times per week each.
NU	Calcium sources	Consumes calcium sources more than four times per week.
NU	Iron sources	Consumes iron sources more than four times per week.
NU	Reading nutrition labels	Report 'often' or 'always' reading three or more of the following: sodium, fibre, fat, and added sugar.
EB	Eating breakfast	Every day
EB	Eating three meals	Every day
EB	Meal preparation	Reports preparing at least 60% of total meals reported.
EB	Meal planning	Reports planning at least 50% of total meals reported.
EB	Water	At least eight 250 mL glasses per day.
SC	Personal goals/values	Reports 'enough' time or more.
SC	Self-appreciation	Reports 'enough' time or more.
SC	Relaxation	Reports 'enough' time or more.
SC	Personal development	Reports 'enough' time or more.
SM	Self-reflection	Reports 'enough' time or more.
SM	Reaching out to others	'Agrees' or 'strongly agrees.'
SM	Time management	Reports 'most of the time' or 'always.'

*Note.* HPB = Health-promoting behaviour; PA = physical activity; SL = sleep; NU = nutrition; EB = eating behaviour; SC = self-care; SM = stress management.

## Physical activity

Three HPBs (i.e., *aerobic, stretching, muscle strengthening*) determined women's frequency and variety of physical activity. Women achieved the *aerobic* HPB if they reported participating in at least 150 minutes of moderate- to vigorous-intensity physical activity (MVPA) per week as recommended by the national guidelines (Ministry of Health, 2015). Women's duration of time spent in MVPA was assessed using the RPAQ, which has demonstrated significant association for self-reported physical activity and objectively criterion ( $r = .70, p < 0.001$ ) and intra-class correlation of 0.76 for overall energy expenditure ( $p < 0.001$ ; Besson et al., 2010). Women reported the type and duration of their usual activities across four domains (work, travel, recreation and domestic life) and all activities were assigned a metabolic equivalent (MET) obtained from the Compendium of Physical Activities (Ainsworth et al.). A MET is a measure of physical activity cost equal to the expenditure of 3.5 ml O<sub>2</sub>/kg/min at rest (Jetté, Sidney, & Blümchen, 1990). Each activity was categorised by intensity level: sedentary (< 1.5 METs); light (1.5 to < 3 METs), moderate (3 to 6 METs); and vigorous (> 6 METs; Besson et al., 2010). Activity durations were summed to calculate the total amount of time (hours) women spent at each intensity level. Moderate and vigorous categories were combined to provide a MVPA category (> 3 METs; Golubic et al., 2014) that could be interpreted against national recommendations.

Women used a seven-point Likert scale (not at all, 1-3 times a month, 1-2 days per week, 3-4 days per week, 5-6 days per week, and every day) to report how often they completed at least 10 minutes of stretching and muscle strengthening exercises. *Muscle strengthening* and *stretching* HPBs were individually accomplished if women reported participating in at least 10 minutes of the respected activities for a minimum of 1-2 days per week (American College of Sports Medicine, 2013; Ministry of Health, 2015).

## Sleep

Six sleep HPBs evaluated women's sleep routine consistency and management of sleep barriers: (1) *sleeping the recommended hours*, (2) *consistent sleep/wake times*, (3) *wind-down*

*routine*, (4) *limiting screen time*, (5) *avoiding sleep stealers* and (6) *limits eating and working in bed*. In order to determine women's sleep duration, women's sleep hours were reported using the PSQI, which identified the typical times that women went to sleep and woke up. Women achieved *sleeping the recommended hours* if the reported amount of time between sleeping and waking was at least seven hours (Hirshkowitz et al., 2015).

For *limiting screen time*, women reported the usual amount of elapsed time between turning off backlit screens and going to sleep by selecting a response from six choices (none, less than 30 minutes, 30 minutes, 1 hour, 1.5 hours, 2 hours, or more than two hours). Women accomplished *limiting screen time* if there was at least a 30-minute window of time between when they turned off backlit screens and when they fell asleep (National Sleep Foundation, 2016).

Women reported all other sleep HPBs using a seven-point Likert scale (not at all, 1-3 times a month, 1-2 days per week, 3-4 days per week, 5-6 days per week, and every day). Women reported how often they adhered to similar times for going to bed and waking up. In order to achieve the *consistent sleep/wake times* HPB, both sleeping and waking scales had to show adherence of at least three to four nights per week (National Sleep Foundation, 2016).

*Avoiding sleep stealers* and *limits eating and working in bed* HPBs were determined by multiple frequency items. HPBs based on multiple frequencies required all reported frequencies to less than three nights per week (National Sleep Foundation, 2016). *Avoiding sleep stealers* included avoiding stimulants (i.e., nicotine and caffeine) within six hours of sleep, alcohol within three hours of sleep, sugar food/drinks within two hours of sleep and naps longer than 30 minutes (National Sleep Foundation, 2016). The *limits eating and working in bed* combined the reported frequencies of eating in bed and working in bed (National Sleep Foundation, 2016).

## **Nutrition**

Ten HPBs accounted for the nutrition HPB category including intakes for (1) *vegetables*, (2) *fruit*, (3) *sodium*, (4) *fibre sources*, (5) *healthy fat sources*, (6) *limiting less healthy fat sources*, (7) *limiting added sugar sources*, (8) *calcium sources*, (9) *iron sources* and (10) *reading nutrition*

*labels*. Achievement criteria for each of the HPBs were largely guided by the Eating and Activity Guidelines for New Zealand Adults (Ministry of Health, 2015). Women reported daily servings for vegetable and fruit intakes. Frequencies reported as “don’t know” were assumed as more than “never” and thus corrected to “1 serving.” The *vegetables* HPB was achieved if women reported at least three servings per day and the *fruit* HPB was achieved if at least two servings were reported per day (Ministry of Health, 2015).

*Limiting sodium, fibre sources, healthy fat sources, limiting less healthy fat sources* and *limiting added sugar sources* HPBs were each based upon multiple frequency items. Women’s sodium sources were based on how frequently (never, rarely, sometimes, often, all of the time) women reported adding salt and soy sauce to their meals. The *limiting sodium* HPB was achieved if both salt and soy were reported as “sometimes” or less (Ministry of Health, 2015). Women’s *fibre sources* were based upon women’s reported intakes of fruit, vegetables, legumes and wholegrain foods. The *fibre sources* HPB was achieved if women reported at least two of the following three frequencies: at least five servings of fruit and vegetables per day, eating legumes at least three to four times per week, choosing wholegrain varieties “often” or more. Women achieved *healthy fat sources* if women reported at least two of the three frequencies: eating seafood at least one to two times per week, cooking with plant-based sources (e.g., olive oil, margarine) and/or adding nuts/seeds to their foods “often” or more. Women achieved *limiting less healthy fat sources* by reporting no more than one of the following frequencies: intakes of fried fish more than twice per week, chips more than twice per week, takeaways more than twice per week or usually cooking with animal-based sources (e.g., butter, lard). *Limiting added sugar sources* was achieved if women reported no more than one of the following: fruit juice more than twice per week, fizzy drinks more than twice per week, energy drinks more than twice per week, sweets more than twice per week or alcohol more than four times per month (equivalent to once per week).

In addition to NZANS items, questions regarding the sources of *calcium* and *iron* were reported as frequencies (never, less than once per week, 1-2 times per week, 3-4 times per week,

5-6 times per week, 7 or more times per week, don't know). Frequencies reported as "don't know" were corrected to "less than once per week" assuming women's intake were more than "never." *Calcium sources* and *iron sources* HPBs were achieved if women reported an intake frequency of at least five to six times per week (National Health and Medical Research Council, 2006).

Women reported how frequently (never, rarely, sometimes, often, all of the time) they looked at sodium, sugar, fat or fibre on nutrition labels. Since the (Ministry of Health, 2015) recommends using nutrition labels to inform food selection (e.g., compare labels of similar foods), women achieved the *reading nutrition labels* HPB if they reported looking at a minimum of three out of the four nutrients "often" or more.

### **Eating behaviour**

Eating behaviour HPBs focused on behaviours that influenced meal frequency and content such as meal preparation and planning. Five HPBs were considered for the eating behaviour category including (1) *eating breakfast*, (2) *eating three meals or equivalent*, (3) *preparing meals*, (4) *planning meals* and (5) *water intake*. A frequency scale (never to less than once per week, 1-2 days per week, 3-4 days per week, 5-6 days per week, every day) was used to report how often women consumed three meals a day (or equivalent) or ate breakfast. *Eating breakfast* and *eating three meals or equivalent* HPBs were achieved if women reported "every day."

In order to determine achievement for *meal preparation*, women reported how frequently (never, less than once per week, 1-2 days per week, 3-4 days per week, 5-6 days per week or every day) they prepared breakfast, lunch, dinner and snacks. Using the same style of frequency reporting, women also reported how frequently they bought meals (pre-prepared foods or takeaways) and how frequently others (e.g., family, flatmates) prepared meals for them (excluding bought meals). The proportion of meals prepared was calculated by dividing the number of meals women prepared by the total overall meals reported. The Ministry of Health (2015) recommends that adults "prepare meals at home as often as possible," thus, women achieved *meal preparation*

if they reported preparing at least 60% of their meals. For *meal planning*, participants provided a weekly frequency of how often they planned each of their meals (breakfast, lunch, dinner, snacks). The total number of meals per week women reported planning was divided by the total number of overall meals. The *meal planning* HPB was achieved if women reported planning at least 50% of their meals.

Women reported their *water* intake by number of glasses (equivalent to 250 mL) they consumed on an average day (none, less than 1, 1-2, 3-4, 5-6, 7-8, 9-10, more than 10). Women achieved the *water* HPB if they reported drinking at least 7-8 glasses per day as per the national guidelines (Ministry of Health, 2015).

### **Self-care**

Evaluation of self-care included four HPBs: (1) *personal development*, (2) *relaxation*, (3) *self-appreciation* and (4) *personal goal/values*. *Personal development* involved women spending time on positive stressors such as trying new activities (e.g., recipe, language, instrument, exercise) or challenging vulnerabilities (e.g., joining a new class, public speaking, speaking up). *Relaxation* included activities that allowed women to wind down and find calmness (e.g., taking a bath, yoga, meditation, going for a walk). *Self-appreciation* encompassed gratitude activities, such as reflecting daily on things they did well or things that went well during the day. *Personal goals/values* focused on women's ability to set time aside for activities that were meaningful to them, such as spiritual development, professional development or spending time with friends and family. All self-care HPBs aligned with the Five Ways to Wellbeing (Mental Health Foundation, 2018). Since each of the self-care HPBs were highly individualised, outcomes were assessed on the women's perceptions of the amount of time dedicated to each area ("not enough," "a little, but needed more" "enough," "a little more than needed," or "too much"). Women achieved the self-care HPB's if they reported spending at least "enough" time or more for each HPB.

## **Stress management**

Three HPBs were assessed for the stress management category: (1) *self-reflection*, (2) *reaching out to others* and (3) *time management*. The *self-reflection* HPB encompassed women's observations and analysis of their stress patterns and triggers. The *reaching out to others* and *time management* HPBs assessed women's capacity to address identified stressors. Similar to self-care, women reported their perception of the amount of time they spent on reflection and achieved the *self-reflection* HPB if women reported "enough" time or more. Women reported how likely they were to reach out to someone for support when needed by rating their level of agreement on a five-point Likert scale (strongly disagree to strongly agree). Women achieved the *reaching out to others* HPB if women reported "agree" or "strongly agree." Lastly, women described how well they felt that they managed their time by general frequency (not at all, rarely, sometimes, most of the time, all of the time). Women achieved *time management* if they reported managing their time well at least "most of the time."

## ***Health Outcomes***

NLH was also evaluated based on whether or not women experienced positive changes to their physical, mental and social health. The health outcome measures were drawn from validated surveys and national guidelines. A summary of the health outcomes assessed is presented in Table 6.

Table 6

*Health Outcome Measures and Assessment Tools*

<b>Outcome</b>	<b>Measure</b>	<b>Assessment Tool</b>	<b>Source/ Appendix</b>
<b>Physical health</b>			
Fitness	Predicted VO <sub>2max</sub>	Heart rate response to Queens College Step Test	American College of Sports Medicine, 2013 Borg, 1982; Appendix S
	Perceived exertion	Borg Scale of Perceived Exertion	
Total physical activity	Total energy expenditure (MET*hours/day), total time reported as MVPA, work, commute, home and leisure domains	Recent Physical Activity Questionnaire	Besson, et al., 2010; Appendix I
Sleep	Global score and eight sleep subscales: duration, disturbance, sleep latency, day dysfunction due to sleepiness, sleep efficiency, sleep quality, need meds to sleep	Pittsburgh Sleep Quality Index	Buysse, et al., 1989; Appendix J
<b>Mental health</b>			
Psychological empowerment	Perceived health-related control	Next Level Health Questionnaire	Smith, et al., 2008; Appendix K
	Perceived health-related competence	Next Level Health Questionnaire	
	Resilience	Brief Resilience Scale	
Psychological wellbeing	Flourishing	Flourishing Scale	Diener, et al., 2009; Appendix L
	Happiness	Subjective Happiness Scale	
Psychological distress	Depression, anxiety and stress	Depression, Anxiety and Stress Scale (21-items)	Lovibond & Lovibond, 1995; Appendix N
Self-perception	Body size dissatisfaction	Figure Rating Scale	Pulvers, Lee & Kaur, 2004; Appendix O
	Body comfort	Next Level Health Questionnaire	
	Body confidence	Next Level Health Questionnaire	
<b>Social health</b>			
Social support	General, friends and family	Next Level Health Questionnaire	
Connectedness	Loneliness	Next Level Health Questionnaire	

*Note:* VO<sub>2max</sub> = maximal oxygen uptake, MET = metabolic equivalent, MVPA = moderate- to vigorous-intensity physical activity

## Physical health

Physical health outcomes were based upon women's fitness, reported physical activity and sleep. Anthropometric measures were also obtained for reference in discussion, however, these measures were not used to evaluate women's success in NLH.

***Fitness.*** Women completed the Queens College Step Test (QCST; American College of Sports Medicine, 2013) to measure aerobic fitness. All women performed the QCST on a standardised anthropometric box (40 cm step height) at a cadence of 22 steps per minute for three minutes (Bungmark, Kulaputana, & Chaiwatcharaporn, 2015). Women were familiarised with the step sequence for 30 seconds using the same step rate (22 steps/min) prior to commencement of the test. Early termination occurred if a woman was unable to keep up with the step rate for more than two consecutive steps or if the woman chose to discontinue the test. Each woman's heart rate (HR) was recorded immediately after the test using a heart rate monitor (Polar FT1 watch and Polar T31 coded transmitter chest strap, model: 90051026, Finland). The predicted maximal oxygen uptake ( $VO_{2max}$ ) was calculated based on women's post-test heart rate using the QCST formula:

$$VO_{2max} \text{ (ml.kg}^{-1}\text{.min}^{-1}\text{)} = 65.81 - (0.1847 \times \text{HR})$$

Where  $VO_{2max}$  is the maximal oxygen uptake and HR is the measured heart rate as beats per minute.

Women rated their perceived fitness using the Borg Scale of Perceived Exertion that ranged from 6, which indicated no exertion, to 20 indicating maximal exertion (Appendix S; Borg, 1982). Women rated their perceived exertion at the start of the step test and each minute thereafter until test completion.

***Anthropometric measures.*** Parameters for BMI were collected to describe the population, but not used as an outcome measure. For BMI, weight was obtained using a standing scale and height was measured using a stadiometer. BMI classification followed standard reference values: underweight ( $< 18.5 \text{ kg/m}^2$ ), normal weight ( $18.5 - 24.99 \text{ kg/m}^2$ ), overweight ( $25.0 - 29.99 \text{ kg/m}^2$ )

and obese ( $\geq 30.0 \text{ kg/m}^2$ ). Additionally, waist-to-hip ratio (WHR) was collected as a reference for discussion, but not considered an outcome measure to assess NLH. Waist and hip measurements were collected following the protocol outlined by the International Society for the Advancement of Kinanthropometry (Stewart, Marfell-Jones, Olds, & de Ridder, 2011). Accordingly, anthropometric tape was used to measure the waist at the narrowest part of the torso and the hip measurement was taken at the widest part of the hips. The WHR value was then calculated by dividing the waist circumference by the hip measurement.

**Total physical activity** Women reported their MVPA using the RPAQ. Women's reported time in MVPA (hours/day) was assessed under each domain (home, work, commute and recreation) as well as overall MVPA. The methods for calculating MVPA and classifying activity intensities are detailed above in the physical activity section of HPB outcome procedures for evaluation. Additionally, women's total energy expenditure (TEE) was calculated by multiplying the time women reported for each activity by the associated MET intensity and obtaining the overall sum of METs for all activities.

**Sleep.** Women's sleep was assessed using the PSQI that comprised 19 self-rated items. The PSQI asked about women's average sleep over the past month and provided the assessment of seven sleep subscales: duration, disturbance, latency (time it takes to fall asleep), day dysfunction due to sleepiness, efficiency (staying asleep throughout the night), quality and need of medication to sleep. The seven sleep subscales were scored from zero (very good) to three (very poor). All component scores were summed to produce a global sleep score classified as experiencing good (scored  $\leq 5$ ) or poor (scored  $> 5$ ) sleep (Buysse et al., 1989). The PSQI demonstrated good reliability and its validity is supported by its ability to significantly discriminate ( $p < 0.001$ ) between control and clinical groups who experience troubled sleep (Backhaus, Junghanns, Broocks, Riemann, & Hohagen, 2002; Buysse et al., 1989; Carpenter & Andrykowski, 1998).

## **Mental health**

Given the thesis aims of empowering women, brief assessments were included to determine women's psychological empowerment. Additionally, women's mental health was assessed across multiple dimensions including psychological wellbeing, psychological distress and self-perception.

***Psychological empowerment.*** Psychological empowerment measures provided a general assessment of individual empowerment, which comprised of women's perceived *resilience* to stress, *control over health* and *competency for health*. The Brief Resilience Scale assessed women's self-reported ability to recover or "bounce back" from stressful situations. The Brief Resilience Scale comprised six statements: three were positively worded (e.g., "I tend to bounce back quickly after hard times") and three were negatively worded (e.g., "I have a hard time making it through stressful events"). All Items were rated on a five-point scale where positively worded items were scored from one (strongly disagree) to five (strongly agree) and negatively worded items were scored in reverse. An average was taken of all statements producing a mean score between one and five; a high score indicated a high level of resilience to stress. The Brief Resilience Scale has been shown to reliably measure resilience regarding coping with stress (Smith et al., 2008).

Using the NLHQ, women's perceived *control over health* and *competency for health* were assessed to further inform women's psychological empowerment for health. Respectively, statements were "I feel in control of my own health," and, "I know what I need to do to be healthy." Women rated their level of agreement from one (strongly disagree) to five (strongly agree).

***Psychological wellbeing.*** Women's sense of flourishing and happiness were identified as key indicators of positive mental wellbeing, as they assess the positive aspects of women's internal context involving both eudaimonic (e.g., positive functional) and hedonic (e.g., state of happiness) dimensions respectively. The Flourishing Scale provided an overview of women's perceived success in social relationships, outlook on life and self-esteem. The Flourishing Scale contained

eight statements that were scored on a seven-point Likert scale ranging from one (strongly disagree) to seven (strongly agree). All eight statements were positively worded describing women's success in life regarding relationships ("My social relationships are supportive and rewarding"), outlook on life ("I lead a purposeful and meaningful life"), perceived ability ("I am competent and capable in the activities that are important to me") and self-image ("I am a good person and lead good life"). The sum of all eight responses provided a total score ranging from 8 to 56. A high score indicated women perceived themselves very positively in important areas of functioning. The Flourishing Scale has been shown to demonstrate high validity against other positive psychometric scales (Diener et al., 2009).

The Subjective Happiness Scale comprised four items measuring global subjective happiness. Lyubomirsky and Lepper (1999) report good validity and reliability for the Subjective Happiness Scale. Participants responded to each statement by rating their happiness from one (least happy) to seven (most happy). One statement regarded general happiness ("In general, I consider myself...") and the other three statements compared women's happiness to others ("Compared to most of my peers, I consider myself..."). All four ratings were averaged to produce an overall score of subjective happiness.

***Psychological distress.*** The DASS-21 is an abbreviated version of the original 42-item test, and has demonstrated consistency among non-clinical populations (Crawford, Cayley, Lovibond, Wilson, & Hartley, 2011; Henry & Crawford, 2005). The scale required women to rate statements from zero (did not apply to me at all) to four (applied to me very much or most of the time) that produced an overall score of psychological symptomology (21 items) and three subscale scores for depression (7 items), anxiety (7 items) and stress (7 items; Crawford et al., 2011). The resulting scores were doubled to align with the 42-item assessment categories and could be described by severity: normal (depression: 0-9; anxiety: 0-7; stress: 0-14), mild-to-moderate (depression: 10-20; anxiety: 8-14; stress: 15-25) and severe (depression: 21+; anxiety: 15+; stress: 26+). DASS-21 has demonstrated a high reliability and comparable validity to other psychometric measures (Henry & Crawford, 2005).

***Self-perception.*** Women rated their perceived body size and ideal body size by selecting from a scale of nine figures that ranging from underweight (one) to overweight (nine) on the Figure Rating Scale. Body size dissatisfaction was calculated as the absolute discrepancy between women’s ideal body size and their perceived current body size (Kelly, Bulik, & Mazzeo, 2011), where a difference of one or more figures signified body size dissatisfaction. The Figure Rating Scale has been demonstrated good consistency between practitioners and with other psychometric scales (Pulvers et al., 2004).

Women’s body confidence and body comfort were also assessed by two additional statements from the NLHQ. Women rated their level of agreement on a five-point scale for two statements: “I feel confident with my body” and “I feel comfortable with my body.”

### **Social health**

Women’s social health was assessed by their perceived social support and sense of connectedness with others. All social health questions were internally designed and included in the NLHQ.

***Social support.*** For social support, women rated their level of agreement using a five-point scale (strongly disagree to strongly agree). Social support involved statements regarding general support (“I would say I have a good support network”), support from friends (“I have quality friends I can seek support from when I need to”), and support from family (“I can seek support from my family when I need to”).

***Loneliness.*** For loneliness, women rated their level of agreement for a single statement (“I have often felt lonely”).

### ***Participant Perceived Outcomes***

Women were asked about their perceived outcomes at post-intervention and follow up. The questions specifically designed to evaluate NLH and embedded in the evaluation forms. Five open-ended questions informed the participant perceived outcomes (Table 7).

Table 7

*Questions to Assess Participant Perceived Outcomes*

<b>Time point</b>	<b>Open-ended question</b>	<b>Assessment Tool</b>
Post-intervention	<ul style="list-style-type: none"> <li>• Did you experience any change(s) to your overall health that you attribute to your involvement in Next Level Health?</li> </ul>	Post-intervention Evaluation Form
	<ul style="list-style-type: none"> <li>• Did you experience any change(s) to your ability for your health that you attribute to your involvement in Next Level Health?</li> </ul>	Post-intervention Evaluation Form
Follow up	<ul style="list-style-type: none"> <li>• Thinking about the outcomes you experienced at the end of the programme (6 months), what do you feel you have maintained?</li> </ul>	Follow up Evaluation Form
	<ul style="list-style-type: none"> <li>• Did the programme impact the way you perceive your health? How?</li> </ul>	Follow up Evaluation Form
	<ul style="list-style-type: none"> <li>• What is the most valuable thing you will take away from participating in the programme?</li> </ul>	Follow up Evaluation Form

**Post-intervention.** Two open-ended questions were obtained from the post-intervention evaluation form that contributed to women's perceived outcomes after NLH. Women were asked about their perceived outcomes as a result of participating in NLH, specifically regarding their perceived changes to their overall health as well as ability for health.

**Follow up.** Three open-ended questions from the follow up evaluation form contributed to women's perceived outcomes after participating in NLH. Questions asked about women's health perceptions after participating in NLH, what they felt they had maintained since post-intervention and what they felt was the most valuable outcome they had experienced from participating in the programme.

## Process Evaluation

Process evaluation commonly assesses the reach (e.g., who participated), fidelity of programme implementation (e.g., the number of sessions delivered, sessions delivered as intended, participant adherence), and the participants' satisfaction with the programme (Nakkash et al., 2012; Saunders, Evans, & Joshi, 2005). The reach of the programme was informed by

women's baseline characteristics and reasons for participating in the programme. The fidelity of NLH implementation was evaluated according to women's adherence to the monthly meetings, progression through the HPB categories (level progression) and engagement with the social media support group. Additionally, women reported their satisfaction for the programme describing what they enjoyed and disliked about NLH as well as their suggestions for improvement.

## *Reach*

### **Reasons for participating**

Women's responses to the entry interviews at baseline regarding why they decided to participate in NLH were used to evaluate the reach of NLH.

## *Fidelity*

### **Adherence**

Women's adherence was based on women's attendance to each of the monthly meetings. Using the post-intervention evaluation form, women also rated how helpful programme components (e.g., Facebook page, monthly meetings) were for their adherence to NLH using a scale from one (not helpful at all) to five (helpful).

### **Level Progression**

Women progressed through NLH according to their achievement for levels within each of the six HPB categories. Details regarding women's progression are described in Chapter Three. Briefly, a woman achieved a level if they accomplished their small goal at least three out of the four weeks. Thus, women had the opportunity to achieve a total of six levels (a level for each HPB category) each month. Additionally, women's progression through the levels was self-determined upon accomplishing their goals. Women's level achievement was logged after each monthly meeting in an excel database. Women had the potential to reach up to six levels for each of the six HPB categories meaning achievement of 36 total possible levels for the entirety of NLH.

### **Social media group engagement**

Women's engagement with the Facebook group was evaluated based on women's interactions including participant posts, comments and likes (Napolitano, Hayes, Bennett, Ives, & Foster, 2013). The number of views each post received from unique members, termed "views", were also quantified. Given that both participants and administrative personnel (V. C. or others from the research team) interacted with social media group, the interactions were classified as participant or administrative engagement. Women's interactions with the social media group were classified as active (i.e., post, comments, likes) or passive (i.e., views). All interactions were recorded after all participants had completed NLH.

### *Participant Satisfaction*

#### **Enjoyed, disliked, and suggestions for improvement**

Using the post-intervention evaluation form, women responded to open-ended questions that asked about their experience participating in NLH (e.g., What did you enjoy? What did you dislike? How could NLH be improved?). Several scale items asked women to rate how helpful the HPB categories were for their health development using a scale from one (not helpful at all) to five (very helpful).

## **Data Analysis**

Following the convergent mixed-methods design, quantitative and qualitative data were separately analysed prior to merging them for interpretation (see Figure 12; Cresswell & Plano Clark, 2018).

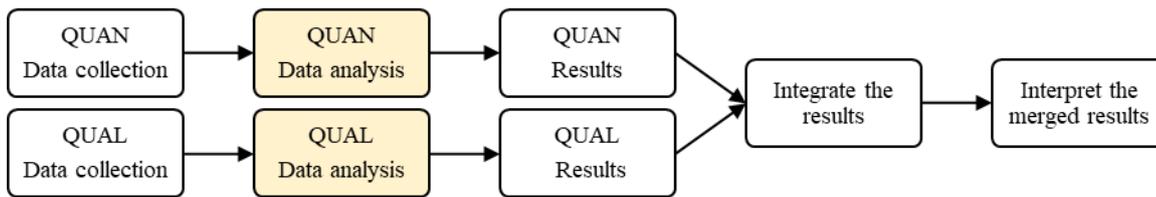


Figure 12. The analysis stage of a convergent mixed-methods design

### Quantitative Analysis

The quantitative data was analysed using statistical software (IBM SPSS Statistics, version 24). The data was examined for normality using Shapiro-Wilk tests. If normally distributed, the data were described by their mean and standard deviations. Non-parametric data (excluding survey scores) were log transformed and retested for normality. If normally distributed, parametric tests were performed on the log transformed data. For the purpose of presenting the data in a meaningful way, the data were then back transformed and described using means and standard deviations. Normally distributed data were compared by time points using repeated measures analysis of variance (ANOVA) and post-hoc t-tests. All non-parametric data (including survey scores) were described by their median and quartiles. Time point comparison for non-parametric data was conducted using Friedman’s ANOVA tests and post-hoc Wilcoxon Signed Rank tests. Statistics were significant at the 95% confidence interval. A Bonferonni correction was applied to post-hoc tests, such that  $p = 0.017$  at the 95% confidence interval and  $p = 0.003$  at the 99% confidence interval. Additionally, an effect size ( $r$ ) was estimated from the absolute value of the standardised test statistic (z-score) following Rosenthal’s equation (as cited in Field & Hole, 2003, p. 238):

$$r = \frac{Z}{\sqrt{N}}$$

in which  $z$  is the z-score from the SPSS output and  $N$  is the number of observations (where testing 55 people twice is equivalent to 110 observations) that  $z$  is based on. The effect size was

considered small if  $r = 0.10$ , medium if  $r = 0.30$  or large if  $r = 0.50$  as recommended by Cohen (as cited by Field & Hole, 2003, p. 153).

### **HPB Analysis**

HPB achievement was assessed by individual HPBs. For each woman, a “1” was assigned for each HPB achieved and a “0” for each HPB not achieved based on the achievement criteria outlined previously in Table 5, p. 75. Thus, each woman could achieve up to 31 HPBs at each time point. Individual HPBs were assessed by descriptive statistics at each time point.

In order to explore women’s HPB achievement by category, individual HPBs were summed by category and normalised to a value of one. For instance, achievement for each of the three physical activity HPBs equated to 0.33 thus achievement for all three HPBs in the physical activity category equated to one. Consequently, achievement between categories was not comparable due to the unequal number of HPBs for each category, but were used to describe a change in HPB achievement across categories.

### **Social media group engagement – quantitative analysis**

The number of posts were totaled as a sum for each month. Given that comments, likes and views were reactions to the posts, each of these forms of engagement were quantified and averaged by the total number of posts for the respective month. Thus, posts were reported as total posts per month, while other interactions were mean interactions per post for each month.

### *Qualitative Analysis*

Women’s oral responses to the open-ended interview at baseline were transcribed verbatim into a single document for each participant. A web application (oTranscribe.com) facilitated transcription. Likewise, women’s written responses from the evaluation forms were typed verbatim and organised by the respective open-ended question. Women’s responses for process evaluation questions were recorded into a separate word document from women’s outcomes responses (participant-perceived outcomes).

## **General Coding procedures**

Women's responses were coded using Dedoose (Dedoose.com, version 7.6.17), a web application designed to analyse qualitative and mixed-methods data. Coding is an analytic method that allows researchers to uncover meaning and patterns among qualitative data (Saldana, 2013). A code "is most often a word or short phrase that symbolically assigns a summative, salient, essence-capturing, and/or evocative attribute for a portion of language-based or visual data" (Saldana 2013, p. 3). The analysis comprised several cycles of coding that began with a descriptive cycle followed by analytical coding cycles to uncover the underlying themes behind the data and their meaning.

As per a view of pragmatism, the research objectives guided code application of the descriptive cycle. Prior to code applications, all responses were read to guide initial analysis. During the initial coding cycle, descriptive and in-vivo codes were applied to meaningful sentences or phrases using descriptive and in-vivo coding. Descriptive codes were words or phrases that captured the essence of the excerpt while in-vivo terms were taken directly from a women's excerpt. For example, the excerpt, "...before this, [health] was all or nothing," was coded using an in-vivo descriptor: "ALL OR NOTHING". Another excerpt, "...I did that and that still counts," was coded using a descriptor, "SMALL STEPS FORWARD". As the first cycle of coding progressed, codes were clarified as their meaning became more pronounced. Some codes were merged that were found to encapsulate the same notion. For example, "FOCUSING ON ACHIEVEMENT" and "AWARENESS OF THE POSITIVES" were merged into a more general concept of "ADOPTING A POSITIVE PERSPECTIVE." The general concepts were then formed into overarching themes.

## **Process Evaluation Coding**

Coding of the process evaluation responses was directly guided by the eliciting question. This approach was favoured given that the process evaluation questions explicitly asked about the factor assessed to evaluate programme implementation (e.g., women's satisfaction or dislike of

the programme). Thus, each set of responses was coded separately guided by the associated question.

### **Participant Perceived Outcome Coding**

A slightly different approach was employed to code participant-perceived outcomes. The first cycle of coding was guided by the principle thesis aim, "...explore how a multidisciplinary programme can empower women through their holistic wellbeing in a Western sociocultural context." Accordingly, the question "...how were women empowered over their health?" guided the first cycle of descriptive coding for each of the five open-ended questions. Health empowerment theory guided the conceptualisation of empowerment (Shearer, 2009; Shearer & Reed, 2004).

The descriptive codes that were generated from the first cycle of coding were explored at a more analytical level to identify overarching themes of the research questions. Descriptive codes were merged into more general ideas as described above. Once the themes were identified, another round of coding was conducted where the excerpts were organised under the identified themes.

### **Social media group engagement– qualitative analysis**

In order to evaluate women's purposes for engaging with the social media group, each post shared to the Facebook group was investigated by its content. Following the general coding procedures described above, each post was thematically categorised based on the purpose of the post.

### *Integrating the Results*

As per convergent mixed-methods design, after separate analysis, the data sets were integrated in order to interpret the data to address the overarching thesis aims and three of the four research objectives:

2. Implement the programme to a group of healthy NZ women and evaluate the success of the intervention in terms of its outcomes and outcome sustainability for women's HPBs, holistic health and participants' perceived outcomes.
3. Evaluate the success of programme implementation in terms of its reach, fidelity and participant satisfaction.
4. Identify key factors of multidisciplinary health interventions that empower women over their holistic health.

Recall that in a convergent mixed-methods design, the researcher first analyses the qualitative and the quantitative data sets separately and then merges the data sets for interpretation (Figure 13).

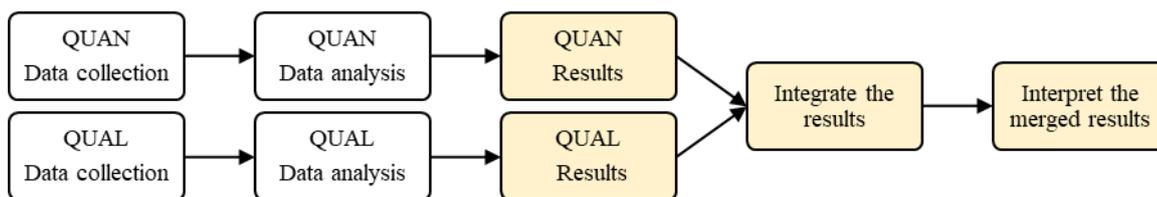


Figure 13. The integration phase of a convergent mixed-methods design.

Cresswell and Plano Clark (2018) highlight four considerations when merging the data: integration intent, integration data analysis procedures, representation of integration results and interpretation of integration results. The intent of integration for the present study was to provide comprehensive results in order to evaluate complex concepts such as women's holistic health and empowerment. Additionally, the integration of the data was a way to validate and confirm the results. Once the data were analysed separately, several steps were taken following integration procedures (Cresswell & Plano Clark, 2018). First, the researcher looked for common concepts across the data sets. Then, for each concept, the data were compared and contrasted to uncover meaning of how the data confirmed, disconfirmed or expanded on the other. Any discrepancies observed between the data sets were then interpreted or resolved with

further investigation (Figure 14). Following a worldview in pragmatism, the research questions guided interpretation of the observed relationships and divergences between the data sets for each of the concepts. The integration of results is presented in a wide variety of ways in mixed-methods studies as a table, narrative format or embedded in the discussion (Cresswell & Plano Clark, 2018). The integration of results for this thesis is embedded in the discussion in Chapters Six and Eight.

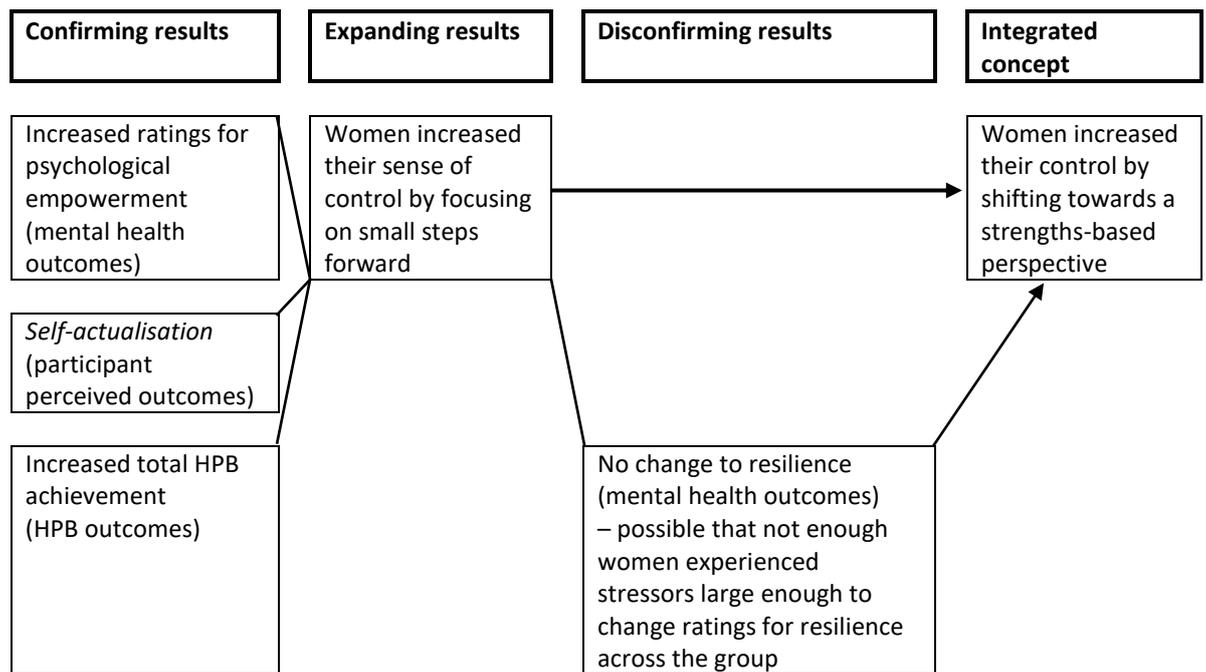


Figure 14. An example of merging the results to obtain integrated concepts.

Integrated concepts are created by identifying themes across quantitative and qualitative data that confirm each other. The themes are then explored against the other data to further expand the concept. Any results that disconfirm the concept are identified and explained to reinforce the integrated concept.

## Validity

As with any research, an investigator must consider a study's validity. In a mixed-methods study design, the researcher must address validity concerns for the quantitative data, qualitative data and their convergence (Cresswell & Plano Clark, 2018). The internal validity of the quantitative data primarily concerns whether the effects observed from the study were due to the independent variable (NLH) as opposed to external variables (Geisinger, 2013). Thus, threats to

internal validity can concern the assessment tools, assessment methods or environmental factors. To ensure the validity of the scores obtained from the women, the majority of instruments employed in the present study had undergone previous validity testing, which has been noted with each respective measure. However, several of the surveys were internally designed or adapted, which was necessitated on the grounds of assessing features and outcomes specific to NLH (e.g., HPBs, NLH implementation) and attenuating participant burden to uphold ethical research. In this case, the use of a convergent mixed-methods design was advantageous because it added an additional layer of validity, such that the qualitative data could confirm or disconfirm findings detected in the quantitative data and vice versa (Cresswell & Plano Clark, 2018). Moreover, women were directly asked about the outcomes they experienced specific to NLH, which could validate the quantitative data and overcome the threat of assumption.

In order to support the authenticity of the responses that women provided, I reminded the women prior to completing any surveys or evaluation forms that the accuracy of their responses was more important than providing a “good” answer. In this case, accuracy was clarified as being reflective of the participant’s thoughts or actions. Internal validity was also accounted for by maintaining consistent data collection procedures and conditions between participants at each time point to minimise the potential for validity threats. More specifically, assessments were completed in the morning, in the same order, at the same location and with the same facilitator to minimise the influence of interpersonal or environmental factors. With exception to the step test and measures of weight and height, women’s assessments and monthly meetings were conducted in a private room to lessen the influence of external factors on women’s responses. In particular, post-intervention and follow up evaluation forms were completed at the beginning of the assessment session so that their interactions with me did not compromise the legitimacy of women’s responses. Additionally, barriers were placed in the shared lab space to isolate separate research activities and the lead investigators kept noise at a minimum in order to maintain a comfortable and consistent atmosphere during assessments.

Next, the validity of women's level progression through each of the HPB categories must be noted. Given that the overall aim of NLH was to support women to make manageable and sustainable health changes, women's progression through the HPB levels was not a strictly "tick box" process. Women largely managed their progression through the levels, because they ultimately held the expert knowledge of what they had achieved over the previous month and what they felt was achievable. In order to support the validity of women's progression, I always prompted them to reflect upon each of their small goals prior to discussing matters of goal achievement or level progression. This reflection was intended to help refresh women's minds about how they felt regarding each goal. Additionally, progression was guided by a rule that women must achieve each of their small goals for a period of at least three out of four weeks in order to consider progressing to the next level. Furthermore, women were always reminded that there was no pressure to move on to the next level if they did not feel comfortable doing so, and that the sole purpose of the goals was for their health development as opposed to the number of levels they achieved. Reiterating these points intended to guide women's attention to the development and sustainability of HPBs rather than achieving as many levels as possible. In sum, I supported the validity of women's level progression by directing their focus to sustainable HPB development, which was ultimately guided by the values established by NLH.

A researcher must also be concerned with the reliability of the quantitative data, such that the scores obtained from the participants are stable over time (Cresswell & Plano Clark, 2018). Similar to instrument validity, findings regarding the reliability of survey scores are reported from previous studies alongside the respective instrument. Precautionary measures were also taken for physical assessments; anthropometric measures were taken multiple times to ensure that at least two measures fell within a 4% standard error following ISAK protocol (Stewart et al., 2011).

In regard to the qualitative data, a researcher is primarily concerned with the validity of the data in that the themes reported in the research accurately reflect the data its sources (Lincoln & Guba, 1985). Qualitative data validity was supported in the current research through triangulation, such that themes reflected outcomes in the quantitative data. For instance, the theme

*self-actualisation* coincided with women's increased ratings for control in the quantitative data. In *shifting towards a holistic* perspective, women reported realising a broader range of benefits from physical activity beyond appearance outcomes, such as "feeling less out of breath." Likewise, women provided lower ratings for perceived exertion at after NLH at post-intervention and follow up. Additionally, I consulted my supervisors with the codes and themes derived from the data in order to mitigate personal bias. The resulting themes were also consulted with several participants from NLH to ensure accurate interpretation of the data. Another factor that strengthened the validity of the data was that I consistently worked with each woman throughout the duration of the study, which held several strengths. First, continually working with each woman over the course of six months enabled the women to become comfortable with me, which supported the authenticity of their responses. Additionally, I was also able to become familiar with each participant allowing a deeper understanding of them and their worldviews, which subsequently strengthened my ability to interpret their responses. Thus, by the end of NLH, I was better equipped to interpret the results of the study on the basis of forming that familiarity and connection with each woman and trust that their responses were honest. I also personally transcribed all of the women's responses, which limited external ambiguity.

The participatory nature of NLH also supported the study's validity. Since I adopted a facilitative role, women led the conversations and reflections during the monthly meetings and I prompted them with questions. Directing conversation by questioning allowed women's voices and values to direct their responses and goals in the programme as opposed to my own. For example, I started each monthly meeting by asking how the previous month had gone thus enabling them to direct the content of the meeting. Therefore, the nature of the NLH design supports the authenticity of the participants in that I did not have to assume much of the person that I was working with. The participatory nature of NLH also strengthened the external validity of the programme because its adaptability enabled the programme's application to a wider range of individual preferences. While women's participation played a key role in the programme, the NLH framework guided their goals and reflections, which supported the reproducibility of the

programme across 58 different participants. External validity is further strengthened by the in-depth description provided of NLH and its process of implementation, so that it can be reproduced.

Common validity concerns to a convergent mixed-methods study design include: (1) not ensuring parallel concepts in data collection between quantitative and qualitative data; (2) keeping the results from different databases separate upon interpretation; and (3) failing to resolve disconfirming results (Cresswell & Plano Clark, 2018). Guided by the overarching thesis aim, both the quantitative and qualitative data investigated women's health and experiences regarding empowerment. Thus, both types of data concerned the same concept. In order to address threats of not integrating the data sets, discussion in Chapters Six and Eight report on the overarching themes. Finally, this thesis minimised the validity threats of disconfirming results, by reporting on contradictory evidence between the different data sets in the discussion sections of the thesis (Cresswell & Plano Clark, 2018).

## **Ethical Considerations**

This project was reviewed and approved by the Massey University Human Ethics Committee: Southern A, Application 14/90. Women who enrolled into the study provided written and informed consent prior to baseline proceedings. Before obtaining women's consent to participate in NLH, I informed women of the programme and its requirements.

Ethical considerations were embedded in the design of NLH given that it was underpinned by the health promotion values of participation, empowerment, equity and adopted a positive holistic perspective of health (Taylor et al., 2014). Incorporating these values supported an ethical health practice and guided the activities of NLH (Carter et al., 2011). Women's active participation was a key aspect of the programme, which worked to uphold their right to autonomy. Women drove the specific topics of the conversations and I adopted a facilitative role by actively listening to what women wanted to say and guided the conversation alongside the NLH framework by prompting questions. Moreover, women were supported to define their own goals and pace

through NLH, which consequently embedded their own personal values and aims in all activities related to the programme. Thus, since women were the primary drivers of NLH activities, ethical harms such as coercion were mitigated. Additionally, the way in which NLH was designed accommodated individual needs well and women were encouraged to explore their own personal motivations for health behaviours. For example, one woman sought to spend more time with her children and physically keep up with them, while another woman aspired to develop a more positive relationship with her body. Each of these women adapted their goals according to their aspirations, which both integrated caring for their health.

A primary ethical concern regarding this population of women was eliciting feelings of body dissatisfaction in conversations concerning health. Prior to implementing NLH, I was aware of key mental health resources and nearby facilities that she could seek advice from or recommend women to as needed. Since health can be a very personal topic, especially when discussing matters such as stress, I prioritized creating a safe and supportive environment by building relationships in order to support women's health and vulnerabilities in an ethical manner. In order for NLH to be successful, women needed to feel comfortable to discuss their health, experiences, opinions and ambitions with me without feeling judged. Thus, the key tactic to support women, regardless of their experiences, was achieved by setting personal biases aside, actively listening to what women had to say and building a sense of trust through shared experiences. Instead of incorporating personal opinions into conversations, a supportive role was adopted. This was achieved by primarily contributing to the conversations by highlighting women's strengths and achievements no matter how small they were in the reflections that the women shared with me. I often asked questions and reiterated what they had told me to demonstrate active listening and to ensure that I understood them properly. Furthermore, I supported women to feel comfortable by seeking common ground between our experiences and matching any vulnerabilities they revealed by sharing my own personal experiences when they were relevant. For example, in regard to body dissatisfaction, women often spoke of discontent with their weight and bodies. Several women discussed a past of eating disorders due to a long history of body dissatisfaction and a desire to

improve this relationship. While it was impossible to relate to every woman's exact experience (which I explicitly acknowledged), I could always find a point of connectivity on the basis of understanding the pressure to attain an ideal body. I often shared my own personal experiences or insecurities and how I dealt with them to help unveil the fallacy of perfection and normalise what they were feeling. I applied this approach in many circumstances, such as when women felt discouraged about not achieving their goals or were lacking motivation.

Cultural competency was another factor to consider in the realm of ethics. Prior to conducting the study, I consulted both Māori and Pacifica advisors to address key cultural considerations to be aware of throughout the programme (see Appendix X for further detail). Given the holistic health perspective as well as the participatory approach adopted by NLH, the programme was compatible with and supportive of different worldviews. For example, one of the women incorporated a strong spiritual component of practicing her faith embedded in her self-care goals related to personal values and time for herself. Additionally, some of the women noted that spending time with family was a key aspect of their health, which was easily integrated into self-care goals, such as spending time for themselves as well as other HPB categories, for instance social physical activity or cooking meals together.

As the facilitator, I implicitly held expert power, which I took care not to abuse. This was managed by adopting an inquiry-based approach and guiding conversation by asking questions and letting women manage the content of the conversations. In the case that discussion arrived at a topic that conflicted with my own personal views or available evidence, I maintained a neutral stance and provided information in a non-coercive manner as necessary. For instance, when women spoke of dieting fads or cutting out entire food groups, we entered discussion about their motivations and beliefs. Women were provided with information based on evidence and a holistic health perspective as invited and I refrained from sharing personal opinions, while reminding them that they are entitled to make their own personal choices. Thus, I always sought to uphold women's right to autonomy and supported them to make informed decisions regarding their own health.

Extra care and precaution was taken when conducting the physical assessments. I ensured that women knew the purpose for taking assessments such as weight, hip and waist measurements such that they were for research purposes as opposed to outcomes for NLH. Women were reminded that these assessments were voluntary and asked if they were comfortable with participating in the assessments. I also accommodated personal requests as needed. For example, some women preferred not to see their weight and, accordingly, I took extra care to conceal this information during the assessments and thereafter. Additionally, since some of the assessments (e.g., step test, height, weight) were taken in a shared lab space, I ensured privacy during the assessments was granted as desired.

There were several key ethical challenges when delivering NLH. In some instances, women did not always feel comfortable discussing HPBs, which made reflective discussion difficult in for some areas (e.g., stress management). In such cases, I instead offered a personal example that we could walk through (e.g., how to address that stressor) according to the respective goal. In rare cases, women refrained from participating in particular categories. For example, one woman was uncomfortable discussing particular goals surrounding nutrition and eating behaviour given her past of disordered eating. Consequently, we adapted her progression through the framework under nutrition and eating behaviour HPB categories to support her to pursue goals she felt comfortable with, such as focusing on trying new recipes and creativity around cooking. Thus, in this case, ethical principles of social justice, beneficence, autonomy and non-maleficence took priority over the fidelity of level progression. Consequently, some of her data was excluded from the data analysis, yet she was able to receive continued support, which consequently supported her to develop a more holistic way of viewing her body and HPBs:

I am more aware of how all the aspects of my health inter-relate. My interest in food from a taste and nutritional point of view has increased rather than focusing mostly on calorie content which is what I did previously (post-intervention).

Thus, in the aim to uphold values of equity, I adjusted NLH in a way that enabled her continued support as opposed to dismissing her participation and discontinuing available support, which would contradict the value of social justice. Likewise, some of the women required more time to discuss their goals than others. On the basis of equity, I occasionally allowed sessions to run longer when women needed more time to talk through their health plans or were experiencing a particularly difficult month and benefitted from the support the NLH meetings offered.

Another challenge was supporting women to achieve health aims and simultaneously counteracting the stress-inducing expectations that women held of themselves. Sometimes women sought goals beyond an achievable level. There were other instances that women considered discontinuing the programme due to not feeling like they were achieving their goals. This challenge was addressed by frequently reminding them that their participation in NLH was completely voluntary and that the overall purpose of the programme was to support them to make small changes to enhance their health on their own accord. I always made it clear that they were ultimately in control of their time and direction in the programme. I further clarified that I held no expectations of them and rather played a supportive role to help them succeed. Women were assured as needed that I was not personally disappointed if they did not achieve their goals that month and that it was all part of the process. Furthermore, I provided women positive reinforcement by revealing their strengths and accomplishments in their reflections no matter how small. For instance, I could always note that their participation in NLH was a point of success because it was a sign that they were actively working toward caring for their health and that adjustments could always be made to dampen the added stress they were experiencing. Thus, by emphasizing these points, an environment of positive reinforcement was created to encourage their self-directed success in an effort to alleviate any added pressure they were experiencing. While two women still discontinued the programme, overall this approach supported women to become more familiar with the process of NLH versus the expectations they held of themselves and, over time, realise their unique definition of what an achievable goal was.

In order to uphold truthfulness of the data, all of the women who participated in the study were represented in the data. All of the women were offered a summary of the assessments they participated in, if they desired that information. Furthermore, all outputs from this study, including this thesis, will be shared with them. Additionally, the data obtained from their time and efforts will contribute to published works, as well as works disseminated in a lay report and presentations to the lay and scientific community.

Finally, women's information was kept confidential and secure. Electronic documents were password protected and hard copy information was secured in a locked cabinet that was located in a secure office. Further protection of confidentiality was ensured by using participant identification numbers on associated documentation and within the thesis to sustain anonymity. Additionally, the social media support group was kept private, such that only women participating in NLH and associated members of the research team had access to information posted in the group. A copy of the approved ethics application and its supporting documentation can be found Appendices T-X.

## NLH Outcomes

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The results from this thesis are reported and discussed in four separate chapters. The present chapter reports on the outcomes that women experienced after participating in NLH, followed by Chapter Six, which discusses the observed outcomes and their integration. Outcomes from the process evaluation are then addressed in the two subsequent chapters. Chapter Five begins by summarising the women who participated in NLH and their adherence to three assessment points: baseline (0 months), post-intervention (6 months) and follow up (12 months). The results are then reported on women's achievement for the 31 HPBs, women's physical, mental and social health and women's perceived outcomes.

## Participants

Overall, 69 potential candidates responded to recruitment, 60 of whom were enrolled into NLH (Figure 15). Two women discontinued their participation in NLH due to being “too busy” and the remaining 58 (96.7%) women adhered to NLH until post-intervention at six months. A further two women were lost to follow up. Therefore, 56 women (93.3%) reported for the 12-month follow up assessments which they completed either in person ( $n = 51$ ) or by distance ( $n = 5$ ). With exception to the five participants who completed their assessments by distance at follow up, all participants reported for their assessment sessions on-site. Reasons for participation by distance included overseas travel ( $n = 4$ ) and not wanting to participate in the physical measurements ( $n = 1$ ). Distance participants only provided responses to assessment surveys and evaluation forms. Women’s enrolment into the programme was staggered across four months, thus the whole of NLH ran for a period of ten months (Sept. 2015 – Jun. 2016) and all follow up sessions were completed thereafter (Feb. 2017).

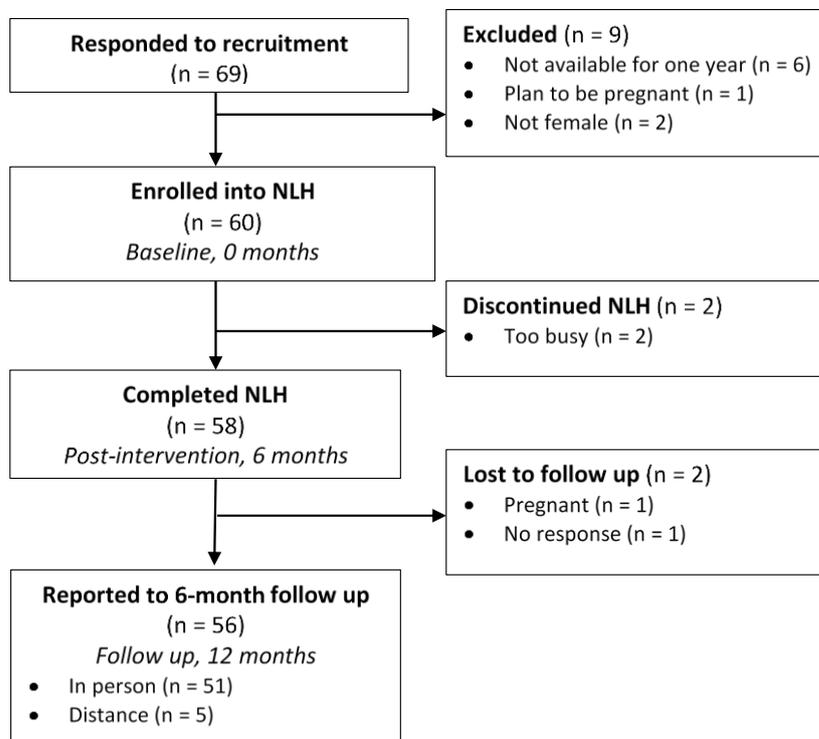


Figure 15. Flow chart of women’s advancement through the study

Women's baseline characteristics are summarised in Table 8. This group of women had a median (*Mdn*) [25<sup>th</sup>, 75<sup>th</sup> percentile] age of 26 [24.0, 28.8] years and a BMI of 23.6 [21.1, 26.3] kg/m<sup>2</sup> that fell within the normal body size classification (World Health Organization). Women were predominantly European (71.7%), employed (88.3%), partnered (61.7%) and without children (90.0%).

Table 8

*Baseline Characteristics of Women Participating in NLH (n = 60)*

<b>Characteristics</b>	<b>n (%)</b>	<b>Mean ± SD / Median [25<sup>th</sup>, 75<sup>th</sup> P]</b>	<b>Range</b>
Age (years)		26 [24.0, 28.8]	19 – 40
19 - 25	26 (43.3)		
26 - 30	22 (36.7)		
30 - 40	12 (20.0)		
Height (cm)		166.7 ± 6.4	149.2 – 183.8
Weight (kg)		68.9 ± 15.6	44.7 – 122.2
Body mass index (kg/m <sup>2</sup> ) <sup>a</sup>		23.6 [21.1, 26.3]	17.2 – 45.4
Underweight (< 18.5)	3 (5.0)		
Normal weight (18.5 – 24.99)	36 (60.0)		
Overweight (25.0 – 29.99)	12 (20.0)		
Obese (> 30.00)	9 (15.0)		
Partner	37 (61.7)		
Mother	6 (10.0)		
Paid Employment	53 (88.3)		
Ethnicity			
European	43 (71.7)		
Asian	8 (13.3)		
Pacific	3 (5.0)		
Māori	3 (5.0)		
African	2 (3.3)		
Other	1 (1.7)		

*Note.* <sup>a</sup> standard reference values (World Health Organization); NLH = Next Level Health, P = percentile.

## Health-Promoting Behaviour Outcomes<sup>2</sup>

Women indicated a significant increase for their total HPB achievement after participating in NLH at post-intervention ( $Mdn = 22$ ) compared to baseline ( $Mdn = 15$ ),  $z = -6.28$ ,  $p < .001$ ,  $r = .60$  (Table 9). Women's HPB achievement at follow up ( $Mdn = 19$ ) remained significantly improved compared to their achievement at baseline,  $z = -5.37$ ,  $p < .001$ ,  $r = .51$ . Women achievement for HPBs varied, which was evident by a wide range between women's total HPB achievement at baseline (6 – 26), post-intervention (10 – 28) and follow up (11 – 28).

Women also improved their HPB achievement under each of the six categories (Table 9). Compared to baseline, HPB achievement significantly increased for all six categories at post-intervention ( $p < .01$  or  $p < .001$ ). Several HPB categories remained significantly improved at follow up compared to baseline: sleep ( $Mdn = 4$ ,  $z = -3.59$ ,  $p < .001$ ,  $r = .34$ ), nutrition ( $Mdn = 7$ ,  $z = -3.71$ ,  $p < .001$ ,  $r = .35$ ), self-care ( $Mdn = 2$ ,  $z = -2.86$ ,  $p < .01$ ,  $r = .27$ ) and stress management ( $Mdn = 2$ ,  $z = -4.10$ ,  $p < .001$ ,  $r = .39$ ). Improvements detected between baseline and post-intervention were no longer significant at follow up for physical activity and eating behaviour.

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<sup>2</sup> The following results report on the 55 women who completed NLH through to follow up. While 56 women attended follow up sessions, one woman was excluded due to missing data.

Table 9

*Summary of Women's HPB Outcomes*

Health-promoting behaviours	Baseline		Post-intervention		Follow up		$\chi^2(2)$	<i>p</i>	Post-intervention vs. baseline				Follow up vs. baseline			
	Median	Percentile [25 <sup>th</sup> , 75 <sup>th</sup> ]	Median	Percentile [25 <sup>th</sup> , 75 <sup>th</sup> ]	Median	Percentile [25 <sup>th</sup> , 75 <sup>th</sup> ]			<i>W</i>	<i>z</i>	<i>p</i> <sup>a</sup>	<i>r</i>	<i>W</i>	<i>z</i>	<i>p</i> <sup>a</sup>	<i>r</i>
Total	15	[13, 19]	22	[19, 24]	19	[16, 22]	55.62	< .001**	1471.00	-6.28	< .001**	.60	1321.00	-5.37	< .001**	.51
Physical activity	1	[1, 2]	2	[1, 2]	1	[1, 2]	13.88	.001**	534.00	-3.28	.001**	.31	240.50	-2.19	.029	
Sleep	3	[2, 4]	5	[4, 5]	4	[3, 5]	34.78	< .001**	942.00	-5.33	< .001**	.50	642.00	-3.59	< .001**	.34
Nutrition	6	[4, 7]	8	[6, 9]	7	[6, 8]	29.14	< .001**	913.00	-4.92	< .001**	.47	872.50	-3.71	< .001**	.35
Eating behaviour	3	[1, 4]	3	[2, 4]	3	[2, 4]	14.91	.001**	292.50	-4.18	< .001**	.40	514.00	-2.18	.029	
Self-care	1	[0, 2]	2	[2, 3]	2	[1, 3]	15.24	< .001**	591.00	-4.12	< .001**	.39	564.50	-2.86	.004*	.27
Stress management	1	[1, 2]	2	[2, 3]	2	[1, 2]	33.70	< .001**	809.00	-5.07	< .001**	.48	672.00	-4.10	< .001**	.39

Note. HPBs possible: Total = 31 HPBs, physical activity = 3 HPBs, sleep = 6 HPBs, nutrition = 10 HPBs, eating behaviour = 5 HPBs, self-care = 4 HPBs, stress management = 3 HPBs. HPBs = health-promoting behaviours;  $\chi^2(2)$  = Chi-Squared test statistic calculated by Friedman's analysis of variance with 2 degrees of freedom; *W* = Wilcoxon's test statistic; *z* = z-score; *r* = effect size calculated from the z-score.

<sup>a</sup>*p* significance value where a Bonferroni correction was applied to post-hoc tests such that  $p < 0.05 = p < 0.025$  and  $p < 0.01 = p < 0.005$ .

\* $p < 0.05$ . \*\* $p < 0.01$

## *Achievement for Individual HPBs*

Figure 16 describes women's achievement for individual HPBs. Out of the possible 31 HPBs, women were the most successful at *aerobic activity*, *limiting less healthy fats* and *limiting sodium* at baseline. In contrast, women began NLH with least achievement for *stretching*, *muscle strengthening* and *reading nutrition labels*. At post-intervention, women showed the greatest ratio of percentage change normalized to baseline completion for *stretching and flexibility* (220.0%), *reading nutrition labels* (183.3%) and *personal goals/values* (125.0%) and the least improvement for *limiting sodium* (-4.65%), *aerobic activity* (1.96%), *meal preparation* (2.63%). At follow up, women demonstrated the greatest ratio of percentage change normalized to baseline completion for *reading labels* (108.3%), *muscle strengthening* (88.9%), *personal goals/values* (87.5%) and *avoiding sleep stealers* (87.5%) and the least improvement for *iron sources* (-6.25%), *meal preparation* (-2.63%) and *aerobic activity* (0.00%).

### **Physical activity**

At baseline, women achieved 1 [1, 2] physical activity HPB (Table 9), which significantly improved to 2 [1, 2] at post-intervention ( $z = -3.28$ ,  $p < 0.01$ ,  $r = .50$ ), but was no longer significantly improved at follow up. Most women were successful at achieving *aerobic activity* at baseline (Figure 16), but there was little difference between time points due to a ceiling effect (baseline: 92.7%, post-intervention: 94.5%, and follow up: 92.7%). More women achieved the *stretching and flexibility* HPB at post-intervention (58.2%) improved from baseline (18.2%), but the success was minimal at follow up (30.9%). While women consistently improved achievement of *muscle strengthening* HPBs, the percentage of completion was still comparatively low.

### **Sleep**

For the sleep HPB category, women achieved 3 [2, 4] out of 6 possible HPBs at baseline (Table 9). Women significantly increased their HPB achievement to 5 [4, 5] HPBs at post-intervention ( $z = -5.33$ ,  $p < .001$ ,  $r = .50$ ). At follow up, the magnitude of improvement was not maintained, but still remained higher compared to baseline,  $z = -3.59$ ,  $p < .001$ ,  $r = .34$ ).

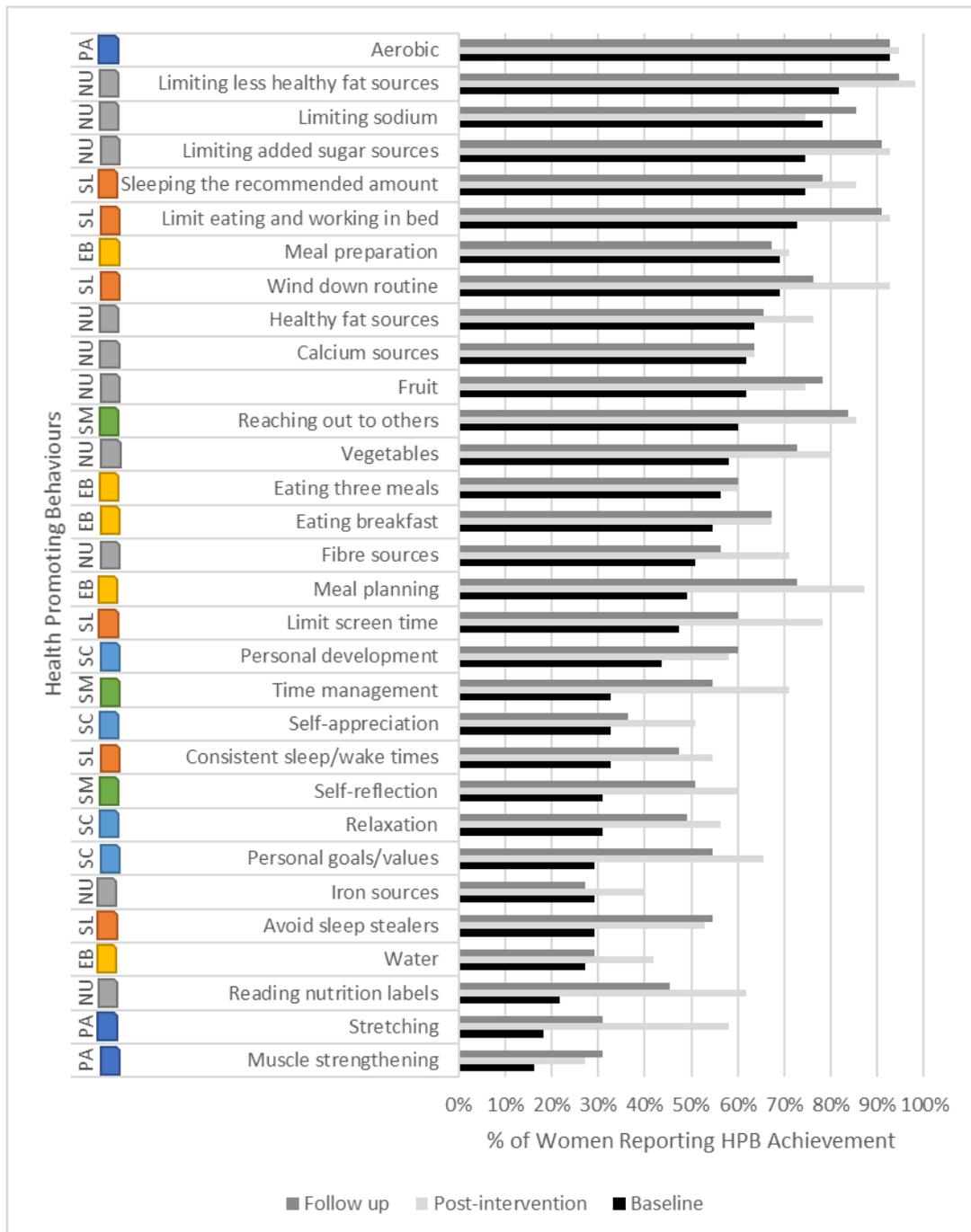


Figure 16. Individual HPB achievement by the proportion of women (%) who achieved them. Individual HPBs are colour-coded by HPB category and descend from most to least achieved at baseline. HPB = health-promoting behaviour, PA = physical activity, SL = sleep, NU = nutrition, EB = eating behaviour, SC = self-care, SM = stress management. Baseline = 0-months, post-intervention = 6-month, follow up = 12-months.

Similarly, substantial improvements were seen across all individual sleep HPBs between baseline and post-intervention (Figure 16). All sleep HPBs dropped at follow up, however, they remained

higher at follow up compared to baseline. Women were most successful at *sleeping at least seven hours per night* and *limiting eating and working in bed* at all three time points. The greatest increase in achievement for sleep HPBs was seen for *limiting screen time before bed* and *performing a wind down routine* between baseline and post-intervention. The least improvement was seen for *sleeping the recommended amount*; however, little room for improvement was possible due to the high achievement rate of this HPB seen at baseline.

## **Nutrition**

Women's achievement for HPBs in the nutrition category increased significantly from a 6 [4, 7] HPBs at baseline to 8 [6, 9] HPBs at post-intervention ( $z = -4.92, p < .001, r = .47$ ) out of 10 possible HPBs (Table 9). HPB increases in the nutrition category were also detected at follow up ( $Mdn = 7 [6, 8], z = -3.71, p < 0.001, r = .35$ ), but to a lesser degree compared to post-intervention. For individual nutrition HPB achievement (Figure 16), women were most successful at *limiting less healthy fat sources* (82.1%), *limiting added sodium* (78.6%) and *limiting added sugar sources* (75.0%) at baseline. Women's achievement for *limiting less healthy fat sources* and *limiting added sugar sources* further improved at post-intervention (respectively, 98.2% and 92.9%) and improvements remained relatively maintained at follow up (respectively, 94.6% and 91.1%). Achievement for *limiting sodium* slightly decreased at post-intervention (75.0%) but improved at follow up (85.7%) compared to baseline. The greatest improvement from baseline was seen for *reading nutrition labels* (62.5%) at post-intervention, which was well-maintained to follow up (46.4%). Women also showed good improvement for achieving intakes of *vegetables* (80.4%) and *fibre sources* (71.4%) at post-intervention that declined yet were still improved at follow up (respectively 73.2% and 57.1%) compared to baseline. Despite improved achievement seen at post-intervention for intake of *healthy fat sources* (75.0%), little to no improvement were seen at follow up (64.3%). Only one woman improved achievement for intake of *calcium* at post-intervention and follow up (64.3%) compared to baseline (62.5%).

## Eating Behaviour

Women achieved 3 [1, 4] out of 5 possible HPBs for the eating behaviour category at all three time points (Table 9). Women's HPB improvement for eating behaviour was small, but significant at post-intervention compared to baseline,  $z = -4.18$ ,  $p < .001$ ,  $r = .40$ . However, improvement detected at post-intervention was no longer significant at follow up. Women showed the lowest improvement for HPBs in the eating behaviour category compared to other HPB categories. For individual HPB achievement for eating behaviour (Figure 16), women made the greatest improvement for *meal planning* at post-intervention (87.5%) compared to baseline (48.2%) that remained relatively high at follow up (73.2%). Improvement was also seen for *eating breakfast* at post-intervention (67.9%) compared to baseline (55.4%) that remained relatively well-maintained at follow up (66.1%). *Eating three meals or equivalent* and *preparing the majority of their meals* showed little change across the three time points. Despite improved achievement seen at post-intervention for *water intake* (42.9%) little improvement was seen at follow up (30.4%) compared to baseline (27.3%).

## Self-Care

Out of four possible HPBs for the self-care category, women achieved 1 [0, 2] HPB at baseline (Table 9). At post-intervention, women significantly improved their self-care achievement to 2 [2, 3] HPBs ( $z = -4.12$ ,  $p < .001$ ,  $r = .39$ ), which were well maintained through to follow up ( $Mdn = 2$  [1, 3],  $z = -2.86$ ,  $p < .01$ ,  $r = .27$ ). Women greatly improved all self-care HPBs demonstrated by more than half of the women achieving each self-care HPB at post-intervention compared to about a third of women completing each self-care HPB at baseline (Figure 16). At follow up, over half of the women still achieved each self-care HPB with exception to practicing *self-appreciation* (35.7%). The greatest improvement was seen for *personal goals/values* at post-intervention (66.1%) compared to baseline (30.4%), which was relatively maintained at follow up (55.4%).

## Stress Management

Similar to women's achievement for self-care HPBs, women significantly increased their achievement for HPBs under the stress management HPBs from 1 [1, 2] HPB at baseline to 2 [2, 3] HPBs at post-intervention,  $z = -5.07$ ,  $p < .001$ ,  $r = .48$  (Table 9). Women maintained this improvement through to follow up,  $z = -4.10$ ,  $p < .001$ ,  $r = .39$ . Women showed the greatest improvement for *time management* at post-intervention (71.4%) compared to baseline (33.9%), which decreased but remained improved at follow up (55.4%; Figure 16). *Reaching out to others* and *self-reflection* were improved at post-intervention (respectively, 83.9% 58.9%) and were either completely maintained (*reaching out to others*: 83.9%) or continued to improve (*self-reflection*: 60.7%) at follow up compared to post-intervention.

## Inter-individual Achievement for HPBs

Figure 17 depicts the variation between women's total HPB achievement at each time point. At baseline, women's total achievement for HPBs was highly varied between participants demonstrated by the many peaks and valleys across the bar graph. For example, participant 21 achieved very few HPBs compared to participant 49. Furthermore, women's achievement for HPBs by category was also varied. This difference can be seen when comparing participants 26 and 27 at baseline. While they achieved a similar number of total HPBs, their achievement for HPBs by category differs.

Women's achievement for total HPBs continued to vary between participants at post-intervention and follow up. However, despite this variation, an overall trend of increased total achievement was seen across participants. Upon referring back to participants 21 and 49, they both increased their total HPB achievement at post-intervention compared to baseline. This trend continued to be true at follow up (total HPB achievement for 21 and 49 remained higher at follow up compared to baseline). Yet, not all participants followed this trend. Participant 26, for instance, appeared to achieve fewer HPBs at follow up compared to baseline and post-intervention. Generally, women's total HPB achievement tended to remain higher at post-intervention and follow up compared to baseline. None of the women achieved all 31 HPBs for any time point.

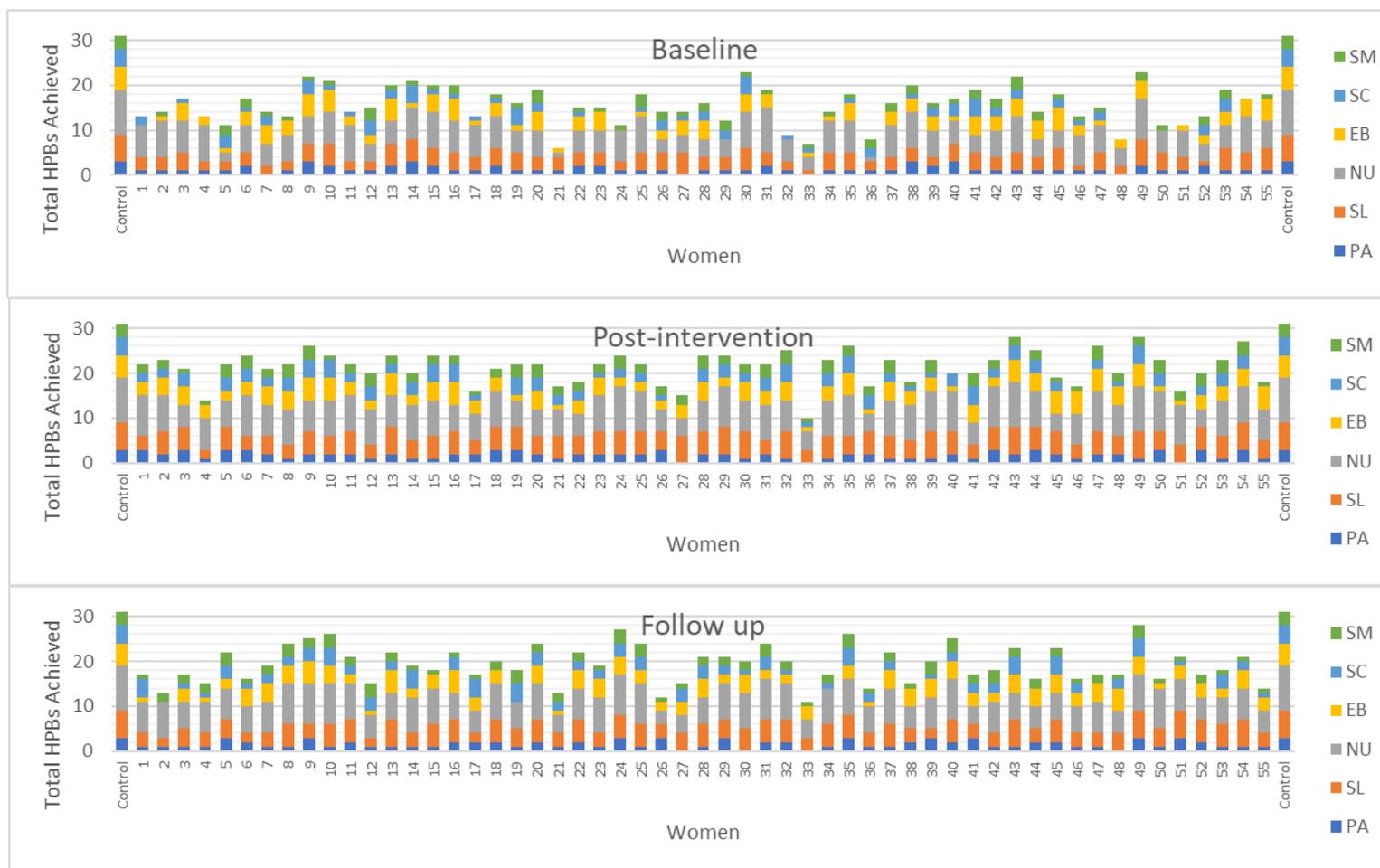


Figure 17. Women’s inter-individual variation for total HPB achievement at baseline, post-intervention and follow up.

The controls at either end of each data set indicate the total health-promoting behaviours (HPBs) possible for each category. Total HPBs possible = 31 HPBs; PA = physical activity, 3 HPBs possible; SL = sleep, 6 HPBs possible; NU = nutrition, 10 HPBs possible; EB = eating behaviour, 5 HPBs possible; SC = self-care, 4 HPBs possible; SM = stress management, 3 HPBs possible.

## Balance of HPBs across Categories

Radar maps were used to depict women’s progress across the six HPB categories after normalizing the number of individual HPBs per category. Since HPB categories contained an unequal number of HPBs, category success could not be directly compared. However, presentation of women’s HPBs using the radars provided a general sense of their ‘balance’ for HPB achievement across the six categories. Figure 18 represents women’s average achievement as a group across the six HPB categories.



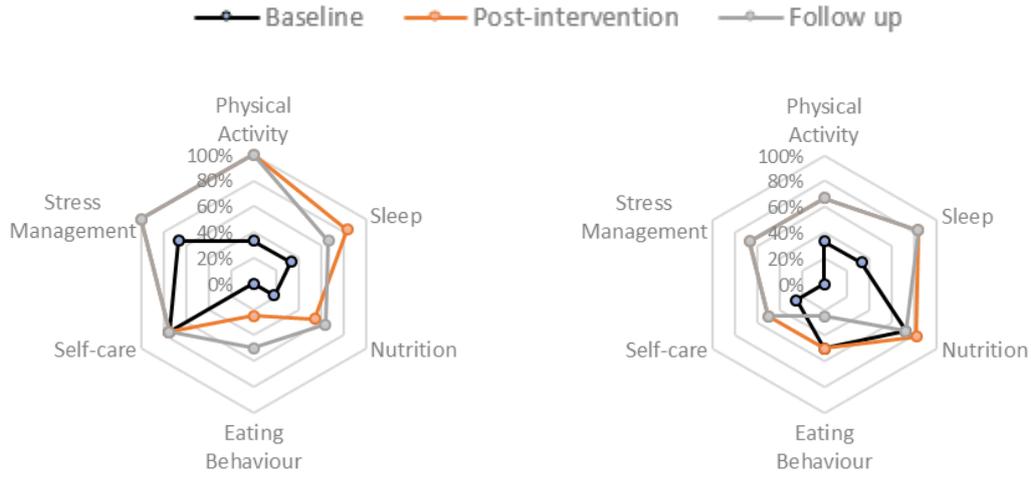
Figure 18. A radar map displaying women's mean HPB achievement across the six categories.

The map shows that women’s achievement for HPBs becomes more “balanced” across the six categories at post-intervention (orange) and follow up (grey) compared to baseline (black).

As a group, women improved their HPB achievement for each of the categories after completing NLH. This improvement was evident by the increased circumference of the orange circle (post-intervention) compared to the black circle (baseline). While, women’s achievement

for HPBs declined at follow up signified by the grey line, their HPB achievement continued to be improved and in balance across the categories compared to baseline.

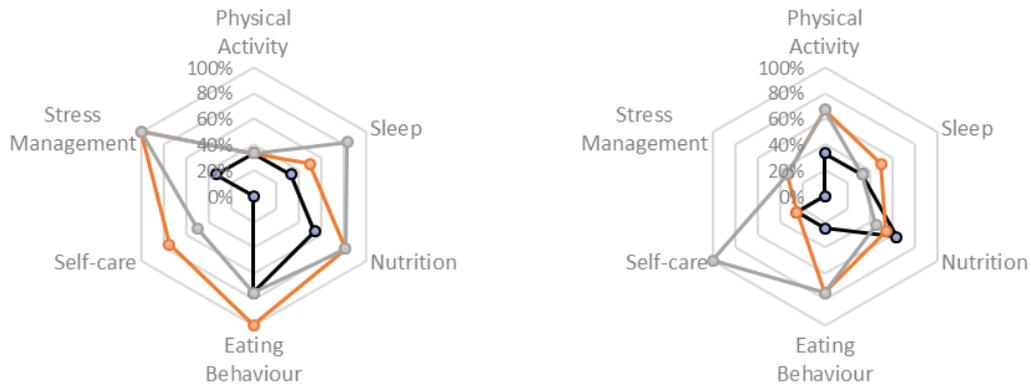
Mapping women by their individual achievement for HPBs using the radars exemplifies the changes in women's balance for achievement across the six categories. Several examples are provided below in Figure 19. The radar maps reveal women's varied HPB achievement for the six categories. Moreover, the radar maps depict how women's achievement for HPBs differs by balance across categories for each time point. Women A and B showed higher achievement for particular areas at baseline, which became more balanced with greater achievement in other domains at post-intervention and follow up. More specifically, woman A was most accomplished at self-care and stress management HPBs at baseline and increased improvement for physical activity, sleep, nutrition and eating behaviour HPBs after NLH. In contrast, woman B began NLH most accomplished at nutrition and eating behaviour HPBs and broadened her achievement for self-care, stress management, physical activity and sleep HPBs after NLH. Some women demonstrated much higher HPB achievement across domains compared to baseline (woman C), while others showed minimal difference between time points (woman D). Despite barriers to physical activity HPBs due to an injury, woman E exemplified her achievement across other domains and particularly for stress management HPBs. Woman F demonstrated declining achievement for nutrition HPBs, yet increased and balanced achievement for HPBs in other domains as she progressed through the programme. Generally, women achieved a greater balance for HPBs at post-intervention and follow up compared to baseline, which can be observed by the distribution of colour-coded categories in the bar graph in Figure 17 (p.117).



A. 36 years, employed, partnered, w/o children (P7)    B. 20 years, employed, single, w/o children (P13)



C. 27 years, employed, single, w/o children (P26)    D. 29 years, employed, partnered, w/o children (P36)



E. 40 years, employed, partnered, mother (P10)    F. 36 years, employed, partnered, mother (P19)

*Figure 19.* Six individual cases for women’s HPB achievement for balance across the six categories. Each case demonstrates women’s unique change in HPB achievement in terms of “balance” across the six categories between baseline, post-intervention and follow up.

## *HPB Outcome Summary*

Women's individual HPB achievement was highly varied across the six categories and for overall HPB achievement. Despite this variation, women largely increased the total number of HPBs they achieved after completing NLH. Women demonstrated improvement for all HPB categories at post-intervention and continued to exhibit improved HPB achievement for sleep, nutrition, self-care and stress management categories at follow up. However, significant improvements to HPB achievement for physical activity and eating behaviour categories were no longer evident at follow up.

With regard to women's achievement for individual HPBs, women were most successful at achieving HPBs for physical activity (i.e., *aerobic activity*), sleep (i.e., *sleeping the recommended amount, limiting eating and working in bed*) and nutrition (i.e., *limiting sources of less healthy fat, sugar, and sodium*) at baseline. At post-intervention, women increased the variety of HPBs they achieved within each of the categories. Women were particularly successful (at least 20% increase of women reporting HPB achievement compared to baseline) for physical activity (i.e., *stretching*), sleep (i.e., *winding down before bed, avoiding sleep stealers, keeping consistent sleep/wake times*), eating behaviour (i.e., *meal planning*), nutrition (i.e., *reading nutrition labels, eating vegetables*), self-care (i.e., *pursuing personal goals and values, relaxation*) and stress management (i.e., *time management, reaching out to others and self-reflection*) HPBs. At follow up, individual HPBs that continued to show greatest improvement (at least 20% increase of women reporting achievement compared to baseline) for sleep (i.e., *avoiding sleep stealers*), eating behaviour (i.e., *meal planning*), nutrition (i.e., *reading nutrition labels*), self-care (i.e., *pursuing personal goals and values, relaxation*) and stress management (i.e., *reaching out to others, time management and self-reflection*). Thus, women reported increased achievement for HPBs across most categories at follow up, particularly for stress management and self-care. Little improvement for women's HPB achievement was evident for individual physical activity HPBs.

Women demonstrated high inter-individual variation for their total HPB achievement throughout NLH, but generally increased their achievement for HPBs at post-intervention and

follow up. Moreover, mapping women's achievement across the six categories indicated women's individual achievement for balance across the HPB categories at post-intervention and follow up compared to baseline. Overall, women exhibited improvements to their health behaviours by the number and the breadth of HPBs they achieved after participating in NLH compared to baseline.

## Health Outcomes<sup>3</sup>

### *Physical Health*

Table 10 summarises women's physical health outcomes at post-intervention and follow up compared to baseline. Women exhibited improved fitness indicated by significantly lower ratings of perceived exertion after NLH compared to baseline ( $p < .01$  to  $< .05$ ). Women's exertion ratings were particularly lower at the three-minute mark of the step test at post-intervention ( $Mdn = 13.0$ ) and follow up ( $Mdn = 13.0$ ) compared to baseline ( $Mdn = 14.0$ ),  $z = -2.86$ ,  $p < .01$ ,  $r = .30$  and  $z = -2.40$ ,  $p < .05$ ,  $r = .26$ , respectively. Women also reported spending significantly more time being physically active during their leisure time at follow up ( $Mdn = 1.11$  hrs/day) compared to baseline ( $Mdn = 0.92$  hrs/day),  $z = -2.95$ ,  $p < .01$ ,  $r = .28$ . Furthermore, women scored significantly better for sleep regarding *sleep disturbance*, *day dysfunction due to sleepiness*, and *sleep quality* ( $p < .001$  to  $< .05$ ). Women's greatest improvements for sleep were lower ratings of *day dysfunction due to sleepiness* at post-intervention and follow up compared to baseline,  $z = -3.80$ ,  $p < .001$ ,  $r = .36$  and  $z = -3.84$ ,  $p < .001$ ,  $r = .37$ , respectively. No other significant differences were detected for other physical health outcome parameters between time points.

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<sup>3</sup> The following results report on the 55 women who completed NLH through to follow up. While 56 women attended follow up sessions, one woman was excluded due to missing data.

Table 10

*Summary of Women's Physical Health Outcomes*

Outcome Variable	Baseline	Post-intervention	Follow up	Post-intervention vs. baseline				Follow up vs. baseline					
	<i>M</i> ± <i>SD</i> / <i>Mdn</i> [25 <sup>th</sup> , 75 <sup>th</sup> <i>P</i> ]	<i>M</i> ± <i>SD</i> / <i>Mdn</i> [25 <sup>th</sup> , 75 <sup>th</sup> <i>P</i> ]	<i>M</i> ± <i>SD</i> / <i>Mdn</i> [25 <sup>th</sup> , 75 <sup>th</sup> <i>P</i> ]	<i>F</i> (2) / $\chi^2$ (2)	<i>p</i>	<i>W</i>	<i>z</i>	<i>p</i> <sup>†</sup>	<i>r</i>	<i>W</i>	<i>z</i>	<i>p</i> <sup>†</sup>	<i>r</i>
Fitness													
Predicted VO <sub>2</sub> <sup>max</sup> (ml/kg/min) <sup>e</sup>	40.5 ± 5.78	40.9 ± 4.20	40.5 ± 3.65	0.34	.717								
Exertion rating @ 1 min <sup>b</sup>	11.0 [9.00, 12.0]	11.0 [11.0, 12.0]	11.0 [9.00, 12.0]	3.35	.187								
Exertion rating @ 2 min	13.0 [12.0, 14.0] <sup>c</sup>	13.0 [11.0 – 14.0] <sup>c</sup>	12.0 [11.0, 14.0] <sup>d</sup>	8.49	.014*	378.00	-2.18	.029	.30	402.50	-2.65	.008*	.28
Exertion rating @ 3 min <sup>e</sup>	14.0 [12.0 – 15.0]	13.0 [12.0 – 15.0]	13.0 [12.0, 15.0]	11.2	.004**	303.50	-2.86	.004**	.30	410.50	-2.40	.016*	.26
Anthropometric													
Waist-to-hip ratio <sup>a</sup>	0.74 ± 0.056	0.749 ± 0.069	0.75 ± 0.062	0.93	.175								
Physical activity													
Total energy expenditure (MET*hrs/day)	34.2 [32.1, 38.1]	34.5 [32.0, 37.3]	34.4 [31.2, 41.7]	0.33	.848								
MVPA (hrs/day)	1.95 ± 2.31	1.90 ± 1.93	2.27 ± 2.18	0.96	.391								
Home (hrs/day)	4.10 [3.10, 5.30]	3.60 [0.90, 13.2]	3.5 [2.40, 5.30]	2.70	.259								
Work (hrs/day)	4.64 [2.50, 5.71]	4.55 [1.32, 5.71]	4.86 [1.21, 5.71]	4.17	.125								
Commute (hrs/day)	0.334 ± 0.302	0.298 ± 0.329	0.410 ± 1.06	0.32	.729								
Leisure (hrs/day)	0.92 [0.65, 1.48]	0.99 [0.63, 1.67]	1.11 [0.59, 2.00]	8.84	.012*	1016.00	-2.06	.039		1122.00	-2.95	.003**	.28
Sleep													

Global score	5.00 [4.00, 7.00]	5.00 [4.00, 7.00]	5 [4.00, 7.00]	3.41	.182								
Duration	0.00 [0.00, 1.00]	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	3.23	.199								
Disturbance	1.00 [1.00 – 1.00]	1.00 [1.00 – 1.00]	1.00 [1.00 – 1.00]	7.18	.028*	63.00	-0.728	.467		78.00	-2.50	.012*	.24
Sleep latency	1.00 [1.00, 2.00]	1.00 [1.00, 2.00]	1.00 [0.00, 2.00]	1.34	.512								
Day dysfunction due to sleepiness	1.00 [1.00, 2.00]	1.00 [1.00, 1.00]	1.00 [1.00, 1.00]	22.1	< .001**	231.00	-3.80	< .001**	.36	230.00	-3.84	< .001**	.37
Sleep efficiency	0.00 [0.00, 1.00]	0.00 [0.00, 2.00]	0.00 [1.00, 2.00]	2.19	.335								
Sleep quality	1.00 [1.00, 2.00]	1.00 [1.00, 1.00]	1.00 [1.00, 1.00]	12.0	.002**	419.50	-3.24	.001**	.31	313.50	-2.28	.023*	.22
Need meds to sleep	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	0.00 [0.00, 0.00]	1.81	.406								

Note. Global sleep score classified as good (< 5) or poor (> 5) sleep. The seven sleep subscales scores range from 0 (best) to 3 (worst). VO2max = maximal oxygen uptake; MET = metabolic equivalent; MVPA = moderate- to vigorous-intensity physical activity; *M* = mean; *SD* = standard deviation; *Mdn* = median; *P* = percentile; *F*(2) = F-ratio analysis of variance test statistic with 2 degrees of freedom;  $\chi^2$ (2) = Chi-Squared test statistic calculated by Friedman's analysis of variance with 2 degrees of freedom; *W* = Wilcoxon's test statistic; *z* = standardised test statistic or z-score; *r* = effect size.

<sup>a</sup> n = 50, missing values due to women reporting by distance (n = 5); <sup>b</sup> n = 49, missing values due to women reporting by distance (n = 5) and incomplete step test (n = 1); <sup>c</sup> n = 47, missing values due to women reporting by distance (n = 5) and incomplete step test (n = 3); <sup>d</sup> n = 46, missing values due to women reporting by distance (n = 5) and incomplete step test (n = 4); <sup>e</sup> n = 45, missing values due to women reporting by distance (n = 5) and incomplete step test (n = 5).

<sup>†</sup> Significance value where a Bonferroni correction was applied to post-hoc tests such that  $p < 0.05 = p < 0.025$  and  $p < 0.01 = p < 0.005$ .

\* $p < .05$ . \*\* $p < .01$

## *Mental Health*

Women experienced significant improvement for mental health regarding factors related to psychological empowerment, psychological wellbeing, psychological distress and self-perception (Table 11). For psychological empowerment, women provided significantly higher ratings for their perceived health-related control and perceived health-related competency at post-intervention and follow up compared to baseline ( $p < .01$  and  $p < .001$ , respectively). Women's rating for perceived competency moved from agreeing they knew what to do to be healthy at baseline ( $Mdn = 4.00$ ) to a rating of strong agreement at post-intervention ( $Mdn = 5.00$ ,  $z = -3.12$ ,  $p < .01$ ,  $r = .30$ ) and follow up ( $Mdn = 5.00$ ,  $z = -3.90$ ,  $p < .001$ ,  $r = .37$ ). No significant differences for resilience scores were observed between time points.

Significant improvements for psychological wellbeing were detected at post-intervention compared to baseline, specifically for happiness and flourishing, ( $p < .001$ ). Flourishing and happiness scores remained significantly improved at follow up compared to baseline, respectively,  $z = -4.03$ ,  $p < .001$ ,  $r = .39$  and  $z = -2.36$ ,  $p < .05$ ,  $r = .22$ .

Women also exhibited a decline in psychological distress indicated by significantly lower scores for depression and stress after NLH compared to baseline ( $p < .01$ ). Depression and stress scores remained significantly lower at follow up compared to baseline, respectively,  $z = -2.59$ ,  $p < .05$ ,  $r = .25$  and  $z = -3.60$ ,  $p < .001$ ,  $r = .34$ . No significant changes between time points were observed for women's anxiety scores.

Finally, women scored significantly better for all self-perception outcome measures after NLH compared to baseline ( $p < .05$  to  $p < .01$ ). Women exhibited the greatest improvement for body comfort demonstrated by higher proportion of women reporting "neutral" or "agree" to feeling comfortable with their bodies at post-intervention ( $z = -2.64$ ,  $p < .01$ ,  $r = .25$ ) and follow up ( $z = -2.63$ ,  $p < .01$ ,  $r = .25$ ) compared to baseline. While no significant differences were seen for women's body confidence ratings between post-intervention and baseline, women's body confidence ratings were significantly higher at follow up,  $z = -2.49$ ,  $p < .05$ ,  $r = .24$ .

Table 11

## Summary of Women's Mental Health Outcomes

Outcome Variable	Baseline	Post-intervention	Follow up	$\chi^2(2)$	$p$	Post-intervention vs. baseline				Follow up vs. baseline			
	<i>Mdn</i> [25 <sup>th</sup> , 75 <sup>th</sup> <i>P</i> ]	<i>Mdn</i> [25 <sup>th</sup> , 75 <sup>th</sup> <i>P</i> ]	<i>Mdn</i> [25 <sup>th</sup> , 75 <sup>th</sup> <i>P</i> ]			$W$	$z$	$p^\dagger$	$r$	$W$	$z$	$p^\dagger$	$r$
Psychological Empowerment													
Control over health	4.00 [3.00, 4.00]	4.00 [4.00, 4.00]	4.00 [4.00, 5.00]	13.2	.001**	331.00	-3.00	.003**	.29	349.00	-3.44	.001**	.33
Competency for health	4.00 [4.00, 4.00]	5.00 [4.00, 5.00]	5.00 [4.00, 5.00]	17.7	< .001**	328.00	-3.12	.002**	.30	312.00	-3.90	< .001**	.37
Resilience	3.33 [3.00, 4.00]	3.67 [3.00, 4.00]	3.33 [3.00, 4.00]	2.36	.308								
Psychological Wellbeing													
Happiness	5.25 [4.25, 5.75]	5.5 [4.75, 6.00]	5.25 [4.50, 6.00]	20.3	< .001**	1107.50	-4.57	< .001**	.44	980.00	-2.36	.018*	.22
Flourishing	47.0 [43.0, 50.0]	49.0 [47.0, 52.0]	49.0 [47.0, 52.0]	20.7	< .001**	1103.50	-3.79	< .001**	.36	1092.50	-4.03	< .001**	.39
Psychological Distress													
21-DASS total	28.0 [20.0, 46.0]	22.0 [14.0, 30.0]	22.0 [12.0, 30.0]	12.0	.003**	1055.50	-3.34	.001**	.32	1078.00	-3.21	.001**	.31
Depression	8.00 [4.00, 14.0]	4.00 [2.00, 8.00]	4.00 [2.00, 8.00]	13.2	.001**	869.50	-2.57	.010*	.25	839.00	-2.59	.010*	.25
Anxiety	6.00 [2.00, 10.0]	6.00 [2.00, 6.00]	4.00 [0.00, 8.00]	4.77	.092								
Stress	16.0 [10.0, 20.0]	12.0 [6.00, 14.0]	14.0 [6.00, 16.0]	11.1	.004**	1002.00	-3.89	< .001**	.37	1120.00	-3.60	< .001**	.34
Self-perception													
Body size dissatisfaction	1.00 [1.00, 2.00]	1.00 [0.00, 2.00]	1.00 [0.00, 2.00]	8.31	.016*	270.50	-2.61	.009*	.25	284.00	-2.05	.040	
Body confidence	3.00 [2.00, 4.00]	3.00 [2.00, 4.00]	3.00 [2.00, 4.00]	9.13	.010**	276.00	-2.16	.031		308.50	-2.49	.013*	.24
Body comfort	3.00 [2.00, 4.00]	3.00 [3.00, 4.00]	4.00 [2.00, 4.00]	11.0	.004**	354.50	-2.64	.008*	.25	400.00	-2.63	.009*	.25

Note. Scoring: control, competency and resilience rated from 1 (strongly disagree) to 5 (strongly agree); happiness scored from 1 (least happy) to 7 (most happy); flourishing scored from 8 (worst) to 56 (best); 21-DASS total, depression, anxiety and stress lower ratings (reduced symptomology) to higher ratings (worse symptomology); body size dissatisfaction scored such that higher ratings indicate greater body dissatisfaction and lower ratings indicate lesser body dissatisfaction; body confidence and comfort rating indicate 1 (low confidence or comfort) to 5 (high confidence or comfort). DASS-21 = 21-item Depression, Anxiety and Stress Scale; *Mdn* = median; *P* = percentile;  $\chi^2(2)$  = Chi-Squared test statistic calculated by Friedman's analysis of variance with 2 degrees of freedom;  $W$  = Wilcoxon's test statistic;  $z$  = standardised test statistic or z-score;  $r$  = effect size.

<sup>†</sup> Significance value where a Bonferroni correction was applied to post-hoc tests such that  $p < 0.05 = p < 0.025$  and  $p < 0.01 = p < 0.005$ .

\* $p < 0.05$ . \*\* $p < 0.01$ .

Women's body size dissatisfaction slightly but significantly improved at post-intervention compared to baseline ( $z = -2.61, p < 0.01, r = .25$ ), however this difference from baseline was no longer significant at follow up.

### *Social Health*

The outcomes for women's social health can be observed in Table 12. While no significant changes were detected for women's ratings of loneliness at post-intervention compared to baseline, women indicated feeling significantly less lonely at follow up compared to baseline,  $z = -2.97, p < .01, r = .28$ . At follow up, women at the 75<sup>th</sup> percentile provided a "neutral" rating for often feeling lonely (3.00 [2.00, 3.00]) compared to a rating of "agreement" for often feeling lonely at baseline and post-intervention (3.00 [2.00, 4.00]). No significant changes for social support outcomes were evident between the three time points. However, upon starting NLH, the women indicated ratings of agreement to having good social support for all domains (i.e., support network, friends, family) providing little room for improvement.

Table 12

*Summary of Women's Social Health Outcomes*

Outcome Variable	Baseline	Post-intervention	Follow up	Post-intervention vs. baseline				Follow up vs. baseline					
	<i>Mdn</i> [25 <sup>th</sup> , 75 <sup>th</sup> <i>P</i> ]	<i>Mdn</i> [25 <sup>th</sup> , 75 <sup>th</sup> <i>P</i> ]	<i>Mdn</i> [25 <sup>th</sup> , 75 <sup>th</sup> <i>P</i> ]	$\chi^2(2)$	<i>p</i>	<i>W</i>	<i>z</i>	<i>p</i> <sup>†</sup>	<i>r</i>	<i>W</i>	<i>z</i>	<i>p</i> <sup>†</sup>	<i>r</i>
<b>Social Support</b>													
Good support network	4.00 [4.00, 5.00]	4.00 [4.00, 5.00]	4.00 [4.00, 5.00]	1.13	.568								
Support from friends	4.00 [4.00, 5.00]	4.00 [4.00, 5.00]	5.00 [4.00, 5.00]	2.68	.262								
Support from family	4.00 [4.00, 5.00]	4.00 [4.00, 5.00]	5.00 [4.00, 5.00]	1.15	.562								
<b>Connectedness</b>													
Often felt lonely	3.00 [2.00, 4.00]	3.00 [2.00, 4.00]	3.00 [2.00, 3.00]	12.2	.002**	167.50	-1.91	.056		326.50	-2.97	.003**	.28

Note. Scoring: social support scales rated from 1 (strongly disagree) to 5 (strongly agree); connectedness rated from 1 (strongly disagree for feeling lonely often) to 5 (strongly agree for feeling lonely often). *Mdn* = median; *P* = percentile;  $\chi^2(2)$  = Chi-Squared test statistic calculated by Friedman's analysis of variance with 2 degrees of freedom; *W* = Wilcoxon's test statistic; *z* = standardised test statistic or z-score; *r* = effect size.

<sup>†</sup> Significance value where a Bonferroni correction was applied to post-hoc tests such that  $p < 0.05 = p < 0.025$  and  $p < 0.01 = p < 0.005$ .

\* $p < 0.05$ . \*\* $p < 0.01$ .

## *Health Outcome Summary*

At post-intervention, findings suggest that women exhibited significant improvement to physical health including fitness (i.e., lower ratings for perceived exertion during the step test) and sleep (i.e., lower ratings for day dysfunction due to sleepiness, better sleep quality). No group outcomes were detected for changes in body composition. The data also indicated women's significant improvement regarding women's mental health for psychological empowerment (i.e., perceived health-related control and competency), psychological wellbeing (i.e., happiness and flourishing), psychological distress (i.e., stress and depression), and self-perception (i.e., improved comfort with body and lower body dissatisfaction). In particular, women showed the greatest improvements for happiness, flourishing and reduced stress. No significant group outcomes were detected for social wellbeing at post-intervention.

Based on the data at follow up, women exhibited more improvements to their physical health. Women continued to report improved fitness (i.e., lower ratings for perceived exertion ratings) and reported more time spent being physically active during their leisure time. Women also continued to report better sleep (i.e., lower scores for *day dysfunction due to sleepiness* and *sleep disturbance*). There continued to be no significant changes to body composition at follow up. For mental health, women continued to exhibit a wide array of improvements psychological empowerment (i.e., perceived health-related control and competency), psychological wellbeing (i.e., flourishing), reduced psychological distress (i.e., lower stress and depression) and self-perception (i.e., body comfort). Additionally, women provided higher ratings for body confidence at follow up. However, the improvements seen for body dissatisfaction post-intervention were no longer significant at follow up. The group did not exhibit significant changes for resilience at post-intervention or follow up. Although social wellbeing outcomes were not significant at post-intervention, women reported feeling significantly less lonely at follow-up. Thus, women exhibited significant improvements to physical, mental and social health after participating in NLH.

## Participant Perceived Outcomes

Four themes arose within women's responses to their perceived success after participating in NLH. The themes were *creating routines*, *shifting towards a holistic perspective*, *health literacy*, and *self-actualisation* (Table 13). While the themes naturally overlapped, they were distinct concepts.

### *Creating Routines*

The first apparent theme among women's responses was *creating routines*. The small nature of the HPB goals enabled women to "fit in" behaviours throughout their days in a repetitive and normalised manner. Despite the diversity of what these routines entailed – and how they were embedded into the day – routines enabled women to integrate this behaviour change into their daily lives. Women's accounts also revealed that routinely participating in small behaviours enabled them to experience the benefits that they provided and thus realise how the HPBs contributed to their health.

Table 13

*Themes for Participant Perceived Outcomes*

<b>Theme</b>	<b>Sub-theme</b>	<b>Excerpt example</b>
Creating routines	Building HPBs into routines	It [NLH] made me realise how easy it was to gain more control of my own health. It only takes little changes within your daily life to really make a difference.  I incorporate the stress-management and self-care into my thinking patterns.
	Routines highlight the importance of HPBs	The importance and benefit of... creating peace and balance in, what can be a hectic lifestyle. Knowing that small changes to lifestyle can make a big difference to overall health.
Shifting towards a holistic health perspective	Health is beyond a physical dimension	[NLH] made me think a little more about health as a wider concept, not just physically which is my default thinking around health. Health is more than looking good. ...I looked at exercise mainly before as way to become thinner etc. Now I see as a way to make me stronger, and also de-stress – impact more areas of my life.
	A wider view of the physical dimension	Definitely gave me a wider view of health, a more holistic view of my own health perception, and the importance and value each of the areas had on health, i.e., not just weight and physicality being the main/primary markers of health
	More holistic sense of self	It [NLH] made me think more holistically about my health, in terms of it including stress management and self-care, which I initially thought were less important but once I made changes in these areas I found that it impacted my health (physically and mentally) in positive ways.
	Realising the integration between health aspects	I thought more about balance i.e., between all the NLH components and how changes in one may affect changes in another eh. Nutrition and exercise impacting sleep. I have changed my perspective on what overall health is through achieving a balance between all aspects of health.
Health literacy	Functional	I am in general more aware of the things I can do (and how easy it is) to maintain a healthy lifestyle and good habits
	Interactional	I am more self-aware of how I am feeling and why and what to do about it. Adjust things to my current health – doesn't have to be all or nothing
	Critical	Social habits regarding sleep/alcohol eg not feeling the pressure to continue past the point I want to if I'd rather head to bed. Less social guilt for that
Self-actualisation	Adopting a positive perspective	I became more aware of all the negative things I would say about myself or my body and have made more of an effort to say or think positive things. ...the self-talk that I would give myself is a lot more positive than before. I'm learning to celebrate the things that I have done well and to look at my failures as an opportunity for learning and growth and to know that it aint a failure unless I decide to give up
	Focusing on small steps forward A holistic perspective unveils their potential	The programme doesn't make me feel I am limited in anyway, which probably comes down to acknowledging every positive step no matter what size (big or small). I have 100% achieved a balance because of this programme. I think this is the best my overall health has ever been.

After NLH, women felt that, opposing to their prior beliefs, health behaviours did not require large amounts of time out of their days, but instead could be easily integrated and become part of their lives. The minute nature of the HPB goals enabled women to achieve these without too many adjustments, and be “more aware of little things I can easily do day-to-day that are healthier options for food, exercise and nutritional activities and sleep patterns” (P52, 25 years, post-intervention). Women described a range of ways in which HPBs became embedded in their days, such as incorporating breakfast into their morning routine, or increasing fruit and vegetable intakes by bringing them as snacks to the office. Other women described building physical activity into their day by taking the stairs or opting to walk as their mode of transport. Such integration enabled women to create positive change for themselves without making significant alterations to their existing schedules. Women often described how making small, healthy adjustments contributed to feeling a greater sense of control over their health. Thus, incorporating small, HPBs within their regular days enabled women to feel more empowered over their health and lives:

It [NLH] made me realise how easy it was to gain more control of my own health.

It only takes little changes within your daily life to really make a difference (P9, 20 years, follow up).

The small changes women initially made often led to bigger changes. As women progressed through NLH and accomplished HPBs, women were encouraged to build new HPBs upon existing ones during monthly planning sessions. By the end of NLH, women had created blocks of multiple HPBs within their usual routines. For example, many women described having a sleep routine to wind down before bed that encompassed multiple sleep goals, such as performing a sleep routine and shutting down screen-based activities early. Women’s routine blocks often combined HPBs from different categories. For instance, women described integrating stretching, time for themselves (e.g., reading, journaling, planning for the week) or routine thinking patterns (e.g., reflecting on stress management prompts, positive self-talk) into their sleep ritual before bed. Thus, women began with small changes to their routine that eventually grew into blocks of HPBs:

Q: Thinking about the outcomes you experienced at the end of the programme (6 months), what do you feel you have maintained?

A: Making small changes to begin with and building on it (P21, 26 years, follow up).

After NLH, women felt more competent in adding to, and carrying out regular health routines. For instance, women reported greater competency for their routines. Some women mentioned organising their HPBs by planning their routines. For instance, women incorporated increasing levels of skills regarding their HPBs such as routinely adding healthy foods to grocery shopping, adding healthier meals to their meal planning schedules or scheduling in physical activity and self-care. Women even reported that despite changing circumstances that would have normally disrupted “healthy routines”, they were able to maintain these behaviours by adapting them to the new situation; for instance, by “maintain[ing] healthy eating (increased veges), regular exercise, good stress management and regular sleep cycles (even when travelling)” (P53, 26 years, follow up). Additionally, after NLH, women managed to achieve their HPBs when their routines fluctuated on a more regular basis. For example, some women reported their continued achievement for self-care, physical activity and nutrition HPBs even when their schedules became busy. Women’s incorporation of HPBs into their dynamic lives demonstrated that the changes were manageable:

Making healthy food choices even in busy situations is easier. More often than not I choose healthier options and make exercise a routine (P41, 35 years, post-intervention).

It is important to note, however, that women did not always report solidifying their HPBs into their daily lives and routines. After NLH, women often noted that the fluctuation of their routines impacted their HPB achievement:

I have not maintained a lot – was doing great for the three months that followed the end of the programme. Had a big change of routine with a new job and did not maintain as many habits immediately. Preparing meals and including lots of veges I have kept up mostly – Nutrition. Physical activity for 3 months following the finish (P4, 25 years, follow up).

Women also reported on their “foundation routines”, which represented their comfort level for HPBs without added cognitive effort of developing or maintaining HPBs. Women’s accounts revealed that developing their foundation routine was seen as a point of success. In the following excerpt, a woman describes how, despite her difficulty maintaining new HPBs, she had reinforced a holistic foundation:

I don’t think my physical health has improved much if at all, yet- because I have not been good at sticking to goals and making them habits, and changes have been small. But I feel I have a really good foundation on which to continue to build. I think my mental health has improved a lot, because the programme has helped me to prioritise it: I was aware that exercise, good eating etc. were important but never truly took on board how important, or put those needs first (P36, 29 years, post-intervention).

Women continued to described their HPB routines at follow up. Most of the women reported specific HPBs they sustained. Several women noted continuing with their HPBs, but to a lesser degree compared the outcomes they accomplished at post-intervention. Others explained maintaining a loose approach to their HPB routines, such as focusing on those that were most relevant at a given time:

I haven’t maintained a very strict goals method but I have kept using the tools and knowledge learned in the 6 months of the programme that helps me keep on top of my health and well-being (P9, 20 years, follow up).

Following NLH, women were more likely to appreciate the importance of regularly engaging in HPBs because they experienced the benefits they gained with frequent HPB repetition. This repetitive nature of routines supported women to identify changes to their health after integrating small HPB changes, "...knowing that small changes to lifestyle can make a big difference to overall health" (P45, 21 years, follow up).

Women indicated becoming more aware of a wide range of positive outcomes across health dimensions that they attributed to making healthy changes to their routines. For example, women noted feeling more energised from consistently winding down before bed, "less out of breath" from regularly walking up the stairs and "mentally less chaotic" from reflecting on their stressors. Women explained that the ability to see these benefits from making small, healthy, changes was motivating. Moreover, identifying their progress over time reinforced the idea that small changes held potential to achieve notable outcomes:

More conscious of the impact small changes can have on my overall health (P7, 36 years, post-intervention).

Overall, NLH enabled women to make changes to their health practices in everyday life by integrating HPBs into their daily routines. Despite encountering a variety of changes to their "regular day", women were able to maintain their HPBs by adjusting them to the given situations. Women's ability to embed and sustain health changes in their daily routines enabled them to feel more in control of their health. The repetition of routines enabled women to discover the benefits of making small health changes to their daily lives. This satisfaction encouraged women to continue their HPB achievement.

### *Shifting Towards a Holistic Health Perspective*

The second central theme that emerged from women's accounts was *shifting towards a holistic health perspective*. Women broadened their conceptualisations of health by shifting from an appearance-based paradigm to a health perspective that placed greater emphasis on mental and

social wellbeing. Women's relationship with "physical" health domains, namely physical activity and nutrition, improved as a result of developing a broader understanding of how these domains impacted their health more holistically. Subsequently, women reported experiencing a wider range of health benefits outside of appearance-based aims. Holistic self-evaluation had important implications for women's acceptance of their bodies and other health behaviours motivated from a place of self-care. Finally, women's responses acknowledged health as a multi-faceted concept by realising the integrative relationships between health aspects and their impacts on wellbeing.

Prior to participating in NLH, many women concentrated on the physical dimension of health, particularly surrounding diet, exercise and body size. After completing NLH, many women reported broadening their health perspectives, and made them "think a little about health as a wider concept, not just physically which is my default thinking around health" (P23, 26, follow up). Specifically, women realised that health extended beyond a physical dimension. For instance, some of the women noted that their scope of health had widened beyond losing weight, while others explained their interpretation for health was no longer constrained to diet and exercise:

I used to think of health as eating well and exercising but it is so much more. I know think of health as encompassing the 6 areas [physical activity, sleep, nutrition, eating behaviour, self-care and stress management] (P22, 29 years, follow up).

Women explicitly reported adopting a holistic health perspective including areas related to the HPB categories, particularly sleep, self-care and stress management. Some of the women who held health-related occupations (e.g., research and physiotherapists) mentioned moving from a *clinical* health focus to placing greater importance on *affective factors* such as stress and self-confidence as well as other aspects of health including sleep, taking breaks, reflection, nutritional health and their routines. Women also reported becoming more conscious of the social dimension of their wellbeing by taking time for themselves when needed, or spending time with friends and family. Likewise, some women mentioned focusing on communication with loved ones and

working on their confidence and positivity during social interactions with others as an important part of their wellbeing.

I think I now include more to the definition of health. Before, I mainly thought it was feeling happy, fit, strong, eating well. But now I think that self-confidence, reflection, sleep, stress, etc. are all major parts (P60, 25 years, follow up).

Women's outcomes revealed that they reorganised their health practices to become more holistic. Women frequently mentioned providing more attention to their mental wellbeing after participating in NLH. Several women clarified that in the past, they considered mental wellbeing as less important or it was "pushed aside" for the importance of physical wellbeing, and that their involvement in NLH enabled them to address "the stress and self-care aspect of my life has made a big difference to my mental health" (P10, 40 years, post-intervention). While participating in NLH, some women described reducing their attention on the physical in order to incorporate other important areas such as sleep, self-care and stress management. Others specifically explained that placing greater emphasis on their mental wellbeing increased their capacity to tend to other aspects of their wellbeing:

Little moments to acknowledge 'you are important. Stop. Breathe. Look after yourself.' Was Huge for me (P2, 37 years, follow up).

Some women explained that the benefits they experienced from emphasising their mental wellbeing highlighted its importance. After NLH, women tended to describe mental wellbeing as equally important to physical wellbeing.

It [NLH] made me think more holistically about my health, in terms of it including stress management and self-care, which I initially thought were less important but once I made changes in these areas I found that it impacted my health (physically and mentally) in positive ways (P29, 28 years, follow up).

Furthermore, women noted how incorporating mental wellbeing amplified the importance of already realised health factors. The following excerpt demonstrates how one woman suggests that exercise and good eating contributed to the benefits she experienced related to her mental wellbeing. Thus, extending her health focus to incorporate mental wellbeing subsequently furthered the importance she placed on known health behaviours.

I think my mental health has improved a lot, because the programme has helped me to prioritise it: I was aware that exercise, good eating etc. were important but never truly took on board how important or, put those needs first (P36, 29 years, post-intervention).

Apart from viewing their overall health as a holistic concept, women specifically described a more holistic approach to experiencing “physical” health domains. For instance, women described shifting their motivations for physical activity from appearance-based purposes to self-care and social purposes. For instance, women described participating in physical activity for social reasons such as exercising with friends and family. One mentioned the substitution of drinking alcoholic beverages for exercising as a social activity with her friends. Some women also identified their participation in physical activity as a way to address their mental wellbeing by exercising for enjoyment and stress relief. Moreover, women’s discovery of new purposes for physical activity during their time in NLH fostered an improvement in their relationship with physical activity.

...I looked at exercise mainly before as way to become thinner etc. Now I see as a way to make me stronger, and also de-stress – impact more areas of my life (P53, 26 years, follow up).

Women also experienced embodiment of physical activity by becoming more attuned to the holistic benefits of exercise. Women reported benefits from participating in physical activity such as increased strength, fitness, flexibility, enjoyment, stress-relief, energy, social growth and positive impacts on other health areas (e.g., exercise enabling improved sleep). Women’s

increased awareness of the holistic benefits of physical activity had important implications for women's motivation and frequency for physical activity, and "and not see the exercise as so much of a chore" (P14, 25 years, follow up).

I have been more likely to try and fit things like yoga into my week than I was before because I am more aware that it helps not only improve my stretching but improve my mental wellbeing and stress management (P60, 25 years, post-intervention).

Likewise, women reported a more holistic approach for nutrition and eating behaviour in their health practice after participating in NLH. As previously mentioned, diet was frequently identified as a physical health domain, often motivated by appearance-based aims. After NLH, women reported experiencing a wide range of benefits from making healthy food choices such as improved digestive health, positive mental and physical wellbeing outcomes in response to eating breakfast and food (and meal preparation) as a source of enjoyment. Women reported an "eagerness to try new foods" (P11, 26 years, follow up) as well as enjoying and experimenting with cooking nutritious meals more. The explicit use of nutrition as embedded amongst the other five HPBs enabled women to see food not only as something that provided nutrients, but that was able to supplement domains such as self-care or stress management.

My interest in food from a taste and nutritional point of view has increased rather than focusing mostly on calorie content which is what I did previously (P55, 25 years, post-intervention).

Similar to outcomes seen for physical activity, some of the women reported a healthier relationship with food. Programme objectives for making sustainable health choices allowed for 'treats' in moderation thus challenging ideas of cutting out entire food groups. Women reported becoming more mindful about making healthy food choices and "negotiating" treats. Others specified shifting from focusing on limiting calories, to a focus on food content. Women's

outcomes for nutrition demonstrated greater control over health by describing a greater consistency for making healthy food choices.

Q: Did you experience any change(s) in your ability for your health that you attribute to your involvement in Next Level Health?

A: I think my ability to enjoy treats/bad food without it derailing me (P18, 27 years, post-intervention).

Women also reported gaining a more holistic sense of self. A key aspect of NLH was that it intentionally did not place success on appearance-based goals and that women's success was evaluated across multiple health dimensions. As a result, women were prompted to explore other ways to evaluate their health. Many women described a shift from evaluating themselves by weight and/or appearance towards a more holistic self-evaluation that placed greater emphasis on their "inner-being" and wide range of other factors.

I'm excited by the thought of exploring the various domains of health and how it is not limited by the way you look, but by the way you feel (P24, 23 years, follow up).

Women described recognising a broader scope of health indicators, which enabled them to evaluate their health in a more holistic way. After participating in NLH, women reported becoming more conscious of the subtle (positive and negative) effects as a consequence to the choices they made. In addition to factors described in relation to physical activity and health eating (described above), women reported awareness for other physical responses to HPBs such as changes to stress, dehydration, tiredness and vitality.

I feel much more attentive of my overall health and balanced well-being – paying attention to how small things affect my sleep and breakfasts' impact on my days (P32, 31 years, post-intervention).

Additionally, women reported a shift from behaviours motivated by appearance-based aims to behaviours motivated by a value of health and self-care.

Love me and my body – I have a massive appreciation for my body and how it functions and I now exercise and try to eat well because I want to look after it, rather than try to lose weight (P39, 28 years, follow up).

Finally, women's shift towards a holistic health focus was evident by women's reports of health as a complex, multi-faceted and integrated concept. Some of the women commented on how health areas impacted each other; for instance, behaviours in nutrition and exercise were seen to impact on sleep and vice versa.

My perspective on health as multidimensional in nature has come about because of the program. I did not realise previously that the elements of health relied so heavily on one another (P24, 23 years, post-intervention).

Women often used the word “balance” to describe how they managed the different, yet integrating, health aspects. Sometimes women described balancing their mental and physical wellbeing. Other times women reported balancing their HPB categories or feeling balanced by responding to their health needs from the different HPB areas. By shifting their focus towards a holistic perspective, women were able gain greater awareness, balance and control across the six HPB domains and subsequently gained health-related control.

It made me more conscious of the different aspects of my health and also how they interact. I had some self-awareness previously but it has made me more deliberate in looking after my health. Of what made me feel healthy (P43, 26 years, follow up).

In summary, women broadened their health perspectives to place greater value on mental and social dimensions of wellbeing. Women's adjustment towards greater consideration of their mental wellbeing encouraged a healthier relationship with their bodies. Additionally, considering

health as a multidimensional concept prompted women to integrate previously ‘physical’ health domains, namely diet and exercise, as a means of enjoyment and self-care; ultimately contributing to other dimensions of their wellbeing (e.g., mental and social dimensions) as well as encouraging a consistent behaviour pattern. Finally, women discovered health as a multi-faceted and integrative concept that enabled them to gain greater awareness of how to manage or “balance” their wellbeing. Thus, the benefits women received from incorporating mental wellbeing into their health practice extended their potential for health benefits that they could experience.

### *Health Literacy*

The next core theme that transpired was women’s improved *health literacy*. Health literacy is a person’s ability to utilise health-related information and gain control over their lives. NLH contributed to women’s improved health literacy at the three different levels (Nutbeam, 2000), such that women developed health-related skills within their daily lives (functional), adapt to changing circumstances (interactional), and challenge contextual constraints (critical). These improvements were evident among women’s reported outcomes concerning the content that they learned during NLH, and specifically, information related to the six HPB categories and small change approach. Additionally, women’s accounts revealed that their participation in NLH improved their health literacy through increased self-awareness. Women’s combined learnings from NLH (content and self-awareness) contributed to greater control over their lives through improved health management.

Women reported their ability to integrate HPBs into their daily lives (*routines*), which exhibited a functional level of health literacy. Women’s accounts reflected their improved skills for each of the six HPB domains. For instance, women reported their increased achievement in nutrition and eating behaviour HPBs by learning how to read nutrition labels and focusing on the guiding principles of variety and moderation, which collectively guided healthy choices for meal planning, food selection and meal preparation. Likewise, many women reported their improvements to stress management HPBs by planning for anticipated stressors and evaluating

stressors as they arose in their daily lives. Specifically, women reported focusing on what they could control in stressful situations:

The stress management tools that I learned during the programme have become second nature, such as better time management, stress management [i.e., how I think about a stressor, how I deal with it at the time, how I minimise potential stressors] (P56, 28 years, follow up).

Likewise, women demonstrated a functional level of health literacy by their ability to focus on and make small health changes in their daily lives. Many women indicated that their ability to focus on small goals was a key outcome that gave them skills and enabled them to gain control over their health:

I see health as manageable rather than an impossible achievement. The small goals made me realise that health is about little life-long habits rather than having unattainable short-term goals. It also made me realise how quickly habits can form e.g., Drinking water, it's normal for me to drink lots now when prior to the programme it wasn't (P40, 23 years, post-intervention).

Women reported that focusing on small goals was important for their HPB motivation:

Maintained a positive approach to exercise – even if I'm not going a lot, I try and do something! (P37, 26 years, follow up).

Additionally, women frequently reported their achievement for health as improved self-awareness, which was indicative of functional health literacy, another way to inform decisions. As described in *shifting towards a holistic perspective*, many women extended their self-awareness by becoming more attuned to a wider array of health indicators beyond appearance and body size, such as their levels for stress or physiological responses. Women mentioned that checking in with themselves to see how they were feeling was an important outcome from NLH.

Thus, women's self-awareness contributed to a functional level of health literacy obtained from NLH:

I am more self-aware of how I am feeling and why and what to do about it (P47, 25 years, post-intervention).

Women also exhibited an interactional level of health literacy through their ability to adapt HPBs to the shifting circumstances often found in a real-world setting. During NLH, women described these changing circumstances as resulting from their external environment (e.g., changing employment, moving residence, travel) as well as their internal environment (e.g., mood, illness, stress). Women provided examples of utilising their HPBs during busy times, travel and incorporating their HPBs into their social relationships with others. Women reported being attuned to their health during such changes and adjusting their HPBs as needed:

I feel I am more aware about the different aspects of my health and how to make choices and goals when I'm feeling low about a specific area (P35, 23 years, follow up).

Accordingly, women's definition of what was achievable was a unique and dynamic concept that required continuous consideration and self-awareness. Moreover, women's self-awareness enabled them to discover their unique health needs at a given moment accompanied by their knowledge of HPBs to address these needs in response. Thus, an interactional level of health literacy was evident through women's adaptation of their approach and perspective to their unique experience of health:

Creating small achievable goals allowed me to see the need to make improvements in my health, especially with stress management. I was able to see how it affected me physically and emotionally, allowing me to design realistic goals that allowed me to overcome/work on my stress (P38, 23 years, follow up).

Women's ability to adapt to their health needs, or an improvement in interactional health literacy, had important implications for the sustainability of HPB outcomes. Sustainability of HPBs demonstrated increased control over their HPBs and thus their health. For instance, one woman reported sustained HPBs at follow up by adapting the skills and knowledge she gained from NLH to suit her unique needs:

I haven't maintained a very strict goals method but I have kept using the tools and knowledge learned in the 6 months of the programme that helps me keep on top of my health and well-being (P9, 20 years, follow up).

However, women also mentioned maintaining their HPBs to a lesser degree. At follow up, some of the women had noted that their achievement for HPBs had lessened since post-intervention and were, "working on building everything else back up to the level it was" (P47, 25 years, follow up). Other women framed their achievement for HPBs in the reverse, noting that they continued to achieve their HPBs with regularity, but less frequently. Other women directed their attention to particular areas and reported continued achievement, however other health domains received less emphasis:

I feel I've maintained practices but to a lower level and less consistently. But I've been focusing on maintaining good sleep practices and exercising (P57, 27 years, follow up).

Women's accounts also revealed their ability to achieve their HPBs that contradicted social norms and subsequently created greater control over their health; thus, women demonstrated a critical level of health literacy. For example, during the programme, women often described feeling "guilty" for taking time for themselves due to externally (and internally) imposed obligations and expectations. After NLH, several women reported creating more time for themselves to do things they enjoy and to reflect on their lives, ultimately confronting socially constructed pressure. Consequently, women created more space for themselves to focus on their wellbeing, do activities they enjoyed and pursue personal development:

I take more time for myself without feeling guilty (P29, 28 years, post-intervention).

Women also reported feeling less social guilt when prioritising their HPBs in the face of social events, such as opting go to bed earlier rather than feeling pressured to stay up with flatmates at home or drinking late into the night with friends. Similarly, women reported choosing to socialise through activity rather than drinking. These examples revealed women's increased autonomy for making healthy choices for themselves in the face of social pressure, demonstrating a critical level of health literacy:

Social habits regarding sleep/alcohol eg not feeling the pressure to continue past the point I want to if I'd rather head to bed. Less social guilt for that (P20, 26 years, follow up).

Women's accounts revealed that their improvements to health literacy enabled them to gain greater autonomy over their health:

I have felt more balanced and in control of my health, like I know what I need to do to feel good and can rely on myself to do those things (P31, 31 years, post-intervention).

Women exhibited health literacy at multiple levels after participating in NLH. They demonstrated health literacy at a functional level by integrating learned HPBs into their daily lives, increasing their self-awareness and learning to make small, sustainable changes. Furthermore, the HPBs women learned in combination with their self-awareness aided them to manage their health in changing circumstances (interactional health literacy), which promoted greater motivation and frequency for HPB achievement and thus control over their health. Women also demonstrated a critical level of health literacy by confronting social pressures through prioritising their HPBs, ultimately exerting greater control over their health. Therefore, women gained greater control over

their health by challenging social pressures and transitioning to a sustainable health practice attentive to their unique needs.

### *Self-Actualisation*

The final theme that emerged from women's responses was *self-actualisation*. Rooted in psychological theory, self-actualisation is conceptualised as realising one's greater potential. Hence, self-actualisation encompassed women's discovery of being the most that they can be. After NLH, women exhibited tenets of self-actualisation, realising their potential for health achievement. More specifically, women perceived this achievement by focusing on small steps forward and adopting a positive perspective. This shift enabled women to become more self-compassionate, overcome personal barriers and recognise their greater capacity for health under physical, mental and social dimensions of wellbeing. Additionally, discovering the integration between health dimensions and domains unlocked women's greater potential to care for themselves.

By adopting a strengths-based approach that emphasised women's achievements, women were more readily able to see themselves as reaching their potential. Women explained how their positive approach to health highlighted their progress and de-emphasised failures:

...the self-talk that I would give myself is a lot more positive than before. I'm learning to celebrate the things that I have done well and to look at my failures as an opportunity for learning and growth and to know that it aint a failure unless I decide to give up (P39, 28 years, post-intervention).

As a consequence of placing greater emphasis on their strengths and achievements, women realised their worth and overcame disempowering social normative discourse. Women described being kinder to themselves and thinking of themselves more fondly after NLH. Women's self-appreciation also translated to their perceptions of their bodies, evident by their

reports of becoming more attuned to their bodies and their functionality. Thus, women embraced their greater potential to connect with themselves and their bodies.

Much more positive in thoughts related to my body, and even more so in thoughts related to myself (P25, 27 years, post-intervention).

Women also self-actualised by realising their progress as they accomplished small goals. Accordingly, women described being more aware of their achievements and realised their greater ability to accomplish health goals. Women explained how identifying their progress made them feel empowered:

I am more aware that I do have the ability and control to make health changes as I have achieved my goals within the programme – which makes you feel stronger and empowered (P60, 25 years, post-intervention).

Women also mentioned that identifying their progress was encouraging for continued HPB achievement and thus supported a sustainable health practice:

The ability to keep taking small steps and making gradual changes in order to succeed in my health goals rather than just giving up (P28, 19 years, follow up).

Additionally, women described how focusing on small steps forward enabled them to overcome personal barriers. Some women acknowledged transitioning from an “all or nothing” health approach; an approach that comprised inconsistent HPB achievement and feelings of failure, to a health practice that was more sustainable by focusing on small achievements:

I realised that I set myself unrealistic goals sometimes and that I can be unnecessarily hard on myself when things don't go to plan. Instead of taking the 'all or nothing' approach like I did prior to the programme, I know now that small steps forward are good and worthy of recognition as success (P56, 28 years, follow up).

In contrast to women who formerly employed an “all or nothing approach,” others struggled stepping out of their comfort zone prior to participating in NLH. Women reported how focusing on small steps forwards during NLH enabled them to try new things and overcome these barriers:

The most important would be that many goals at once are manageable and are within my reach. Mental boundaries that I set for myself have often restrained me towards goals like exercise and eating healthy. For me, that has been a constant battle between knowing what is good for me and not acting in a way that would help me succeed. This programme has done wonders in terms of fighting this inhibition to stay within my comfort zone when it comes to exercising or participating, and learning new ways to great habitual behaviour in order to eat healthy and care for myself appropriately. Constant checks with where I am today and where I would like to be in a week has come from this programme, something I would never practice a year ago. I would always say that that run can wait until tomorrow and give in to laziness, but after many months of baby steps and seeing little spouts of progression, motivation has replaced excuses (P24, 23 years, follow up).

Women also reported that focusing on small steps forward made it easier to “reset” if they fell out of good health habits. As previously mentioned (*health literacy*), regardless of their initial approach to health, women’s experiences of health were dynamic and their motivation fluctuated dependent upon external and internal factors:

It [NLH] helped me to focus on my good efforts, regardless of how small they were/the frequency. I have a less ‘self-punishing’ attitude towards health goals and I don’t worry about what I haven’t done that I would have liked to. I don’t put pressure on myself to follow something and am a lot more positive about starting from a few steps back if I get into bad habits (P4, 25 years, follow up).

Subsequently, women's realisation of their ability to accomplish new activities and overcome personal barriers contributed to women's sense of self-worth. Women's accounts revealed that women became increasingly self-aware of realising their progression fostered greater self-worth and self-confidence.

I tried many different things that I probably would not have if I did not participate in the programme. I became more self-aware of myself and things I was able to accomplish, which made me appreciate myself more! (P38, 23 years, follow up).

Women provided examples of how they realised their greater capacities for physical, mental and social dimensions of health. Under a physical dimension, women reported improvements to their fitness, flexibility and strength. For instance, several women realised their improved ability to participate in physical activities (e.g., running, walking) longer and further than before:

...it [NLH] let me know what I am able to \*make\* the change on my behaviour, i.e., I can exercise!! (At least, I didn't like exercise before the programme and exercising usually couldn't last long) (P3, 36 years, follow up).

For mental wellbeing, women commonly reported reductions in stress and improved ability to manage and evaluate stressors. Women reported that better stress management consequently improved their energy levels, sleep and realise their potential for other activities contributing to their wellbeing (e.g., physical activity, activities for enjoyment and wellness). Women also discovered their improved ability for affective and cognitive management:

Yes, mental health has improved. Able to control and evaluate emotions better than before (P12, 26 years, post-intervention).

Women also described their greater achievement for health under a social dimension. Women discovered their ability to improve communication and confidence in their social interactions. Such improvements were beneficial for social relationships:

Socially, able to stay cool and positive when interacting with other people without letting my personal worries affect the relationships (P3, 36 years, post-intervention).

Finally, women mentioned that developing a holistic health perspective contributed to their self-actualisation. More specifically, women realised their greater potential to achieve health by gaining a deeper understanding for the multiple dimensions of their physical, mental and social wellbeing as well as realising a broader range of HPBs that contributed to their wellbeing:

I have 100% achieved a balance because of this programme. I think this is the best my overall health has ever been (P40, 23 years, post-intervention).

Women self-actualised by shifting to a positive health perspective by focusing on achievable goals and recognising their small steps forward. This shift enabled women to independently identify their progress as they achieved HPBs. Additionally, focusing on small, positive steps enabled women to overcome personal barriers and adopt a more sustainable approach to their HPBs. Women described that this transition supported them to reduce feelings of failure and develop a greater self-confidence and self-worth. Additionally, women realised their greater potential to achieve health across multiple health dimensions. Lastly, women's development of a holistic health perspective extended their ability to care for and experience their health to a greater degree.

I became more aware of how different factors the programme focused on worked together to make me feel my best (P46, 23 years, post-intervention).

### *Participant-Perceived Outcome Summary*

Women's self-reported outcomes generated four main themes: *creating routines*, *shifting towards a holistic perspective*, *health literacy* and *self-actualisation*. Women created *routines*, by integrating HPBs into their usual lives, which enabled them to manage their HPBs in a sustainable manner. Women reported *shifting towards a holistic health perspective* by broadening their

understanding of health beyond a physical and appearance-based paradigm. Hence, women became more aware of their mental and social wellbeing, which broadened the way they experienced and evaluated their health. As a result, women adopted a more holistic sense of self and described transitioning their motivation for HPBs from appearance-based values to a focus on self-care. Women's accounts additionally revealed their improvement to *health literacy* at multiple levels. At a functional level, women described integrating HPBs across the six categories, learning to make small, sustainable health changes and improving their self-awareness. Collectively, these elements contributed to developing women's *health literacy* at an interactional level. Specifically, women described their ability to manage their health during changing circumstances by making HPB changes informed by their self-awareness and vice versa. Women's accounts also hinted at a critical level of *health literacy* by prioritising their HPBs in confrontation with social pressures. As a result, women's *health literacy* enabled them to gain greater control over their health and increase their autonomy. Furthermore, women's perceived outcomes exhibited improvement by *self-actualisation*. After NLH, women described shifting towards a positive perspective by concentrating on small, steps forward. This approach enabled women to approach their HPBs more sustainably and overcome personal barriers. Additionally, women *self-actualised* by developing a holistic approach to health, which enabled them to affect and experience their health to a greater degree.

### *Interacting Themes*

Women's *routines* fostered improvement for *health literacy* and *shifting towards a holistic health perspective*. The repetition of women's *routines* contributed to improving their awareness for their HPBs and response to HPB modification (self-awareness). Additionally, women evaluated the effects of their HPB alternations within their routines using a holistic focus. Thus, the knowledge women gained by incrementally building HPBs into their *routines* contributed to women's outcomes for *health literacy* and *shift towards a holistic health perspective*. Furthermore, as women's abilities through *health literacy* and *shifting towards a holistic health perspective* grew, women realised their small steps forward and increased potential

to experience health across multiple dimensions thus fostering their *self-actualisation*. Women's *self-actualisation* in turn improved their confidence to continue and initiate more HPB changes across a wider scope of domains (*creating routines*). As a result, women created a positive feedback cycle due to the small changes they made to their routines and the recognition of their small steps forward. This exchange between change and reflecting on their progress generated an increased awareness, which contributed to improving their *health literacy, routines, holistic health perspective* and *self-actualisation*.

## *Chapter 6*

# Discussion of NLH Outcomes

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Up to this point, the outcomes women exhibited and experienced after participating in NLH have been presented. These outcomes included changes to women's HPBs, health (physical, mental and social domains) and participant perceived outcomes. Chapter Six proceeds by integrating and discussing the outcomes observed. The chapter begins with a brief overview of the thesis aims and results identified from the previous chapter, and then progresses into discussion. Throughout the discussion, the evidence emerges in support that women became empowered over their health.

This thesis sought to design a multidisciplinary health programme that empowered women over their health in a Western sociocultural context. Thus far, I have presented the outcomes that women experienced after participating in NLH in terms of their HPBs, holistic health dimensions and self-defined outcomes. Overall, the results indicate that women increased the quantity and variety of HPBs they performed. Women exhibited positive outcomes for multiple health domains, namely physical and mental health. While no significant improvement were evident for social health immediately following NLH, women exhibited significant improvements to feeling less lonely six months following the programme. Finally, the participant perceived outcomes encompassed *creating routines, shifting towards a holistic health perspective, health literacy* and *self-actualisation*. These results collectively suggest that women became empowered over their health by increasing their capacity for HPBs, adopting and experiencing a holistic health approach and realising their greater control over health thus enhancing their autonomy.

Women's increased achievement for total HPBs at post-intervention suggests that they engaged in more strategies to care for their health after participating in NLH. Moreover, women not only reported achieving *more* HPBs, but women reported their accomplishment for a greater *variety* of HPBs as well as a deeper understanding for each of the health categories.

**Sleep.** Women broadened their approach to sleep from a focus on sleeping the recommended hours to incorporating HPBs that addressed sleep quality. This transition was evident by women's increased achievement for sleep HPBs additional to *sleeping the recommended amount* and *limiting eating and working in bed*. The participants' responses to the PSQI also demonstrated significant improvements to their sleep after NLH such as their reduced *day dysfunction due to sleepiness* at post-intervention ( $p < 0.001$ ) and follow up ( $p < 0.001$ ). Such subjective improvements to sleep have been shown to correspond with objective assessment measures of less broken sleep and improved sleep efficiency (Hsu, Tsao, & Lin, 2015), which strengthens the current findings. Not only did women exhibit improved sleep outcomes by the PSQI, but the participant perceived outcomes revealed that women experienced benefits from

engaging in a wider variety of sleep strategies (*shifting towards a holistic health perspective*). For example, women described feeling more energetic during the day, which subsequently translated into other health domains, such as physical activity and nutrition. These findings align with others' that report women's increased activity and reduced napping throughout the day after participating in a sleep hygiene intervention (Hudson, Portillo, & Lee, 2008). Women's improved ability to address their sleep behaviours in the present study provides important insights given that women often experience poor sleep (Bei, Coo, Baker, & Trinder, 2015; Hale, Emanuele, & James, 2015; Samaranayake et al., 2014; Signal et al., 2007), which often co-exists with other health concerns such as poor mental wellbeing (Bei et al., 2015; Samaranayake et al., 2014).

***Nutrition and eating behaviour.*** Similarly, women adjusted their approach to nutrition to account for food quality as opposed to a general focus on food quantity and calories. At baseline, women primarily accomplished nutrition HPBs that restricted unhealthy nutrients (e.g., *limiting less healthy fat sources and added sugar sources*). While these HPBs align with the recommended guidelines (Ministry of Health, 2015), they were also reflective of weight control strategies employed by nearly half (45%) of a sample of 1601 NZ women (Leong et al., 2013). After NLH, women achieved a greater breadth of HPBs that were nutrition enhancing (e.g., *vegetable, fruit and fibre intakes as well as reading nutrition labels*) that continued to be achieved at a higher rate at follow up compared to baseline. These results are promising increasing fruit and vegetable intakes among women beyond intervention have proved to be difficult by others (Lapointe et al., 2010). Additionally, over the course of NLH women moved from being restrictive and rigid, to being more flexible and mindful of their eating practices, which was guided by principles of variety, balance and moderation (*health literacy*). Similar to NLH, other non-diet approaches have demonstrated improved awareness for physiological cues to hunger and satiety (Bacon et al., 2005), intuitive eating (Carbonneau et al., 2017; Cole & Horacek, 2010), diet quality (Carbonneau et al., 2017), eating behaviours (Bacon et al., 2005; Bégin et al., 2018), psychological wellbeing (Bacon et al., 2005; Bégin et al., 2018) and self-perception (Bacon et al., 2005). Several reviews also indicate the psychological benefits of adopting a non-diet approach eating (Clifford et al.,

2015; Schaefer & Magnuson, 2014; Van Dyke & Drinkwater, 2014). Thus, findings from NLH, contribute to the observed benefits of promoting healthy eating via non-diet approaches. Furthermore, NLH offers a study design that is less time-intensive as compared to other successful non-dieting interventions – monthly one-hour meetings versus one-hour weekly meetings (Cole & Horacek, 2010) or three-hour weekly meetings (Carbonneau et al., 2017). Therefore, further investigation is warranted to explore the impacts of NLH on women’s nutrition using comprehensive assessments, such as food diaries to more fully capture the essence of these findings. Additionally, the potential contributions of NLH to the growing field of intuitive eating should be explored.

While women’s outcomes for eating behaviour HPBs at post-intervention reverted at follow up, participants still experienced related benefits. Upon observing HPBs individually, women’s achievement for *meal planning* remained relatively high at follow up (73.2%) compared to baseline (48.2%). The participant perceived outcomes also unveiled women’s greater competencies for food management, expanded repertoires for meal preparation (e.g., trying new recipes, cooking methods), and greater enjoyment for preparing meals, which supported other health domains (e.g., nutrition, stress management, self-care). Developing practical food skills has shown to evoke benefits, such as increased confidence with cooking, time management and reduced barriers including cost, waste and knowledge (Garcia, Reardon, Hammond, Parrett, & Gebbie-Diben, 2017). It is likely that women continued to experience their reported benefits beyond NLH, but were inadequately captured. The eating behaviour HPB assessment parameters based achievement on factors like proportion of meals prepared and eating breakfast every day, which may have been too absolute. Women’s improved ability to interpret nutrition labels, plan meals, and learn new preparation techniques/recipes counteract a large proportion of barriers to nutrition literacy that individual’s commonly experience, such as knowledge, attitude, skills/abilities and time (Truman & Elliott, 2018). Alongside meal planning, eating behaviour HPBs may be better evaluated as behavioural determinants (e.g. enjoyment, knowledge, efficacy) for meal preparation and food choice. Additionally, given that the outcomes for eating behaviour

HPBs at post-intervention seemingly reverted at follow up, NLH may benefit from providing further support for women regarding eating behaviour strategies. Such improvements could include a greater emphasis on developing practical skills and education either by offering group classes or through the use of visual tools (e.g. photo diaries, videos), which hold the potential to be empowering strategies (Garcia et al., 2017; Holmberg et al., 2018). Of course, individuals also experience environmental barriers, such as limitations at home, work, geographical, social and/or cultural norms (Truman & Elliott, 2018), which requires intervention at the system level. Thus, individual level interventions need to be accompanied by systems level advocacy.

***Self-care and stress management.*** Self-care and stress management HPBs became a more prominent aspect of women's health practices after NLH. HPB achievement for both self-care and stress management categories were significantly improved at post-intervention and follow up compared to baseline ( $p < 0.001$ ). In particular, participants repeatedly noted taking "time for themselves" (self-care) and reflecting upon their stressors (e.g. "what can I control?" stress management), which were key strategies to care for their mental wellbeing. Participating in such strategies provided a space where women could balance their needs with the demands they experienced (externally and internally). Strömback et al. (2013) report similar findings detected among girls who participated in a stress management course. The girls described learning to "set limits" and prioritise their needs for solitude and relaxation that confronted their perceived external pressures of responsibilities from others, themselves and the media. Similar to findings from NLH, others have conceptualised women's "creating space" as a collective concept such that relaxation, enjoyable activities and reflection are shared with familiar others (Duberg, Möller, & Sunvisson, 2016; Strömback et al., 2013; Ussher, Charter, Parton, & Perz, 2016) or in isolation (Strömback et al., 2013). This need for space may be explained by a discourse of "normative femininity" that modern Western women are exposed to, which entail demands of perfection, achievement and availability (Strömback et al., 2014). Women's internalisation of this normative femininity can create an overwhelming amount of stress that can disrupt one's relationship with themselves and their bodies (Strömback et al., 2014). As such, creating space for themselves and

for reflection was clearly valuable among women participating in NLH who consequently prioritised these strategies into their everyday lives.

Accordingly, women enhanced their mental health after participating in NLH. Significant improvements were evident in both the quantitative and qualitative data. Moreover, the participant perceived outcomes revealed that women *experienced* these benefits signified by their reports of feeling more in control of their stress, increased energy, a stronger sense of self and improved relationship with their bodies, which consequently contributed to other health domains (e.g., physical activity, nutrition, sleep). Other interventions that aim to empower women similarly report improvements to self-esteem (Bégin et al., 2018; Mensinger, Calogero, Stranges, et al., 2016; Tirlea, Truby, & Haines, 2016), body esteem (Bégin et al., 2018; Gagnon-Girouard et al., 2010; Strömback et al., 2016), self-image (Strömback et al., 2016), quality of life (Gagnon-Girouard et al., 2010; Mensinger, Calogero, Stranges, et al., 2016) and reduced depressive symptoms (Bégin et al., 2018; Strömback et al., 2016). The participant perceived outcomes also revealed that experiencing such benefits to their mental health was encouraging for continued participation in supportive HPBs. The follow up period for the current study was limited to six months, which limits interpreting the sustainability of women's outcomes without extrapolating. However, other empowerment interventions have detected women's continued improvements to psychological wellbeing up to one (Bégin et al., 2018; Gagnon-Girouard et al., 2010) and even two years post-intervention (Mensinger, Calogero, Stranges, et al., 2016), which is encouraging with respect to findings from the current study. This study contributes to the current research by demonstrating that healthy women living in NZ can demonstrate improvements to their mental health after participating in NLH. Improved mental health among healthy women is an imperative finding given that women in particular experience higher rates of poor mental health in NZ (Ministry of Health, 2017; Samaranayake et al., 2014). Such benefits among a healthy group may be protective against future decline of mental health. Promoting sustainable improvement to healthy women's mental health using an empowering and multidisciplinary approach answers the need to address upstream issues of poor mental wellbeing or "primary prevention" as opposed to

downstream efforts of reversing pathology (The Mental Health Commissioner, 2018). Findings from the current study further support the need for a shift towards promoting wellbeing. Furthermore, the results indicate that women realised the value of their mental wellbeing by experiencing the benefits of practicing self-care and stress management behaviours in their daily lives. These findings offer a way forward to support women's mental health promotion.

***Physical activity.*** Given that nearly half of NZ women do not meet the physical activity recommendations (Ministry of Health, 2017), women's reports of an improved relationship with physical activity after participating in NLH are promising. Prior to NLH, participants frequently reported that physical activity was primarily seen as a way to address body size and weight. These views are unsurprising given that NZ women often employ physical activity as a way to control weight (Leong et al., 2013). However, motivations driven by appearance are shown to disrupt their exercise participation (Homan & Tylka, 2014; Huberty et al., 2013; Pfister et al., 2017). Women discovered the potential for physical activity to impact their lives more broadly beyond a narrowed view to body size and appearance. This realisation had positive implications for women's motivation; participants described having a healthier relationship with activity and being more likely to integrate small bouts into their day. Embedding physical activity into individual context and having a broad range of motivations are recognised as important factors for continued physical activity participation among NZ women in mid-life (Yarwood et al., 2005). Furthermore, women perceived fewer barriers to exercise, indicative of the lower ratings of perceived exertion. Others concur that women who experience more benefits (e.g., enjoyment, reduced stress) and fewer barriers (e.g., exertion, time) tended to show greater adherence to physical activity behaviours after intervention (Huberty et al., 2013; Huberty, Ransdell, et al., 2008). The current study addresses the need to support women to realise a broad range of purposes to engage in physical activity relevant to their own lives in order to support ongoing participation (Berlin, Kruger, & Klenosky, 2018; Segar, Eccles, & Richardson, 2008; Yarwood et al., 2005) and a positive relationship with oneself (Strelan, Mehaffey, & Tiggemann, 2003; Tylka & Homan, 2015).

Women's improved relationship with exercise did not translate to the time they spent being active or type of exercise they participated in. While women increased their achievement for *stretching* and *muscle strengthening* HPBs at post-intervention, these improvements were no longer significant at follow up. Thus, women continued to predominantly participate in aerobic activity. McEwan et al. (2016) found that positive change to physical activity behaviour occurs when participants are provided the choice of which aerobic activity to participate in. However, the authors of the review reported that the evidence was less clear for other types of physical activity, such as muscle strengthening. Further research is warranted to determine successful strategies to promote the sustainability of a varied exercise routine. Additionally, based on findings from the RPAQ, no significant improvements were detected for the amount of time women spent physically active. This lack of change may be explained by the fact that the majority of women already achieved the recommended amount of physical activity for *aerobic activity* at baseline. Furthermore, it is likely that the small bouts of activity women reported integrating into their days were too small to report in the RPAQ. Unfortunately, the fitness monitors (MiBands) used to objectively assess women's physical activity were not of research quality and objective assessments could not be confidently interpreted (see Appendix Y for further detail regarding the MiBands). Future iterations of NLH could consider evaluating physical activity with research-grade physical activity monitors for objective activity assessment. Regardless, evidence from the present study supports that women involved in NLH continued to meet the recommended 150 minutes of MVPA per week.

While women's behaviours improved across the six categories individually, the added value of NLH lies in its holistic approach to health and the combined effects of six different behaviour domains that led to better health overall. Given that holism is defined as "greater than its constituent parts," it is imperative to note that approaching health improvement through six different domains had a combined effect. It is unlikely that six individual interventions addressing these health domains would not have had the equivalent to this combined effect when considered independently. A significant outcome of NLH was women's increased achievement for HPBs,

such that they increased in a balanced way across the six domains. Women realised a greater variety of HPBs across the six domains and developed greater understanding of their synergistic relations that addressed their health. The simultaneous focus on different health behaviours enabled “cross-contamination” between domains, which enhanced their experience of engaging in health promotion for themselves. Especially given that behaviour goals have shown to facilitate and impede each other (Rhodes, Quinlan, & Mistry, 2016) as well as cluster (Prendergast, Mackay, & Schofield, 2016). Based on women’s reported outcomes, it can be argued that the multidimensional nature of women’s experiences, such as experiencing self-care by engaging in enjoyable physical activity or realising the mutual benefits between good sleep health and physical activity, was a significant contribution to the outcomes observed. Other empowerment programmes support the value of holistically embracing health behaviours by incorporating a range of activities across multiple health domains (Carbonneau et al., 2017; Ho, Sing, & Wong, 2016; Jorna, Ball, & Salmon, 2006; Kinney, Rodgers, Nash, & Bray, 2003; McElligott, Leask Capitulo, Morris, & Click, 2010; Mensinger, Calogero, Stranges, et al., 2016; Tirlea et al., 2013). While many of these programmes provide evidence for the benefit of multiple health domains, the majority of studies are evaluated using quantitative methods that fail to capture the benefit of promoting health in an integrative manner. Ho et al. (2016) briefly report on participant evaluations of a holistic work empowerment programme who highlight the value of gaining a more holistic perspective that enabled them to be more present in their work. The findings from NLH highlight how approaching health with a holistic practice can be empowering by creating a greater sense of control over health and self-actualisation. The findings from the current study greatly contribute to this area of research.

Holistic health is also of significance to indigenous populations who favour holistic health approaches that account for factors such as interpersonal connectivity and provide a sense of ownership over health; such experiences receive less emphasis under a Western lens (Auger, Howell, & Gomes, 2016; Warbrick, Wilson, & Griffith, 2018). Given that indigenous populations often experience worse health and health disparities (Ministry of Health, 2017), an approach like

NLH could be useful in tailoring behaviour change goals into a more holistic, and culturally appropriate, health promotion programme. The interconnected nature of the health behaviours for improved health outcomes is a significant and exciting finding. Future research needs to further investigate the interplay between holistic health dimensions and consider how holism can be utilised to enable synergies across health category outcomes. Additionally, future iterations of NLH could explore enhancing the social and spiritual dimensions more prominently among the health behaviours.

A prominent finding was that women moved from a physical conceptualisation of health to a broader view that integrated HPBs they had not previously regarded essential to their health, such as self-care, stress management and sleep. Women typically conceptualise health as a physical concept tied to behaviour monitoring and management regarding exercise and eating, with the aim of a “healthy” body size (Abou-Rizk & Rail, 2014; Pfister et al., 2017; Wright, O’Flynn, & Macdonald, 2006). Such body policing is deeply embedded in Western values (Cairns & Johnston, 2015; Paquette & Raine, 2004; Tiggemann & Zaccardo, 2015). This neoliberal pedagogy of health is linked to body ideals that foster guilt and anxiety related to health (Burrows et al., 2002; Curtis & Loomans, 2014; Pfister et al., 2017). After participating in NLH, women overcame this view of health and demonstrated a deeper understanding regarding health behaviours beyond a physical paradigm of exercise, eating and body ideals. By broadening their approach to health, women gained greater control by implementing a wider variety of HPBs into their daily lives to address and experience their health more fully without drastically changing their everyday lives (*creating routines, shifting towards a holistic perspective, self-actualisation*). Moreover, women became more compassionate towards themselves as they evaluated their health more evenly across the health dimensions and placed less emphasis on factors such as weight or appearance. Consequently, behaviour became a way to care for themselves rather than motivated by extrinsic, appearance-driven purposes. For example, women reported participating in physical activity and nutrition as a favour to their bodies and as a way to address their mental wellbeing, as opposed to weight-loss. Researchers suggest that participating in behaviours motivated by

intrinsic purposes and broad evaluation of worth are attributes of women with positive body image (Tylka, 2012; Wood-Barcalow et al., 2010) and continued health behaviours (Yarwood et al., 2005). These findings combined with outcomes from the current study indicate that participation in NLH enabled women to transition towards a more positive body image. Programmes with aims to empower women over their health within a Western sociocultural context have shown similar results, such as improvements to self-esteem (Bégin et al., 2018; Gagnon-Girouard et al., 2010; Huberty et al., 2010; Huberty et al., 2009; Mensinger, Calogero, Stranges, et al., 2016; Tirlea et al., 2016), body esteem (Bégin et al., 2018; Gagnon-Girouard et al., 2010; Tirlea et al., 2016), reduced internalised weight stigma (Mensinger, Calogero, & Tylka, 2016) and improved body awareness (Strömback et al., 2016). NLH is unique in its targeting of healthy women and supporting them to place equal focus across the six health domains.

The results revealed that women not only improved their HPBs across six domains, but also were able to gain deeper understanding for HPBs in relation to their individual contexts. Themes across the qualitative results indicated that women not only described acquiring new health knowledge, but also were able to apply this knowledge to the constantly shifting circumstances of their everyday life through incessant reflection (*health literacy, creating routines*). Consequently, women exhibited a functional, interactional and critical level of health literacy (Nutbeam, 2000) that enabled them to become more autonomous in caring for their health in their daily lives. Women also demonstrated improved health literacy through increased knowledge, competence and motivation for their HPBs and a holistic perspective of health (Sørensen et al., 2012). Improving health literacy is considered a core aim in the shift from traditional to modern health education (Nutbeam, 2018). Nutbeam (2018) highlights the need for current health education to align with modern health promotion values, such that people learn skills that improve their decision-making as opposed to simply conforming to “pre-defined” health goals. The findings from the current study suggest that NLH offers such a form of building health literacy at the individual level. Critical health literacy scholars further point to the importance of social, political and environmental action within this realm to address social determinants of health

and reduce inequalities (Nutbeam, 2018; Sykes, Wills, Rowlands, & Popple, 2013). Thus, further research could consider how individual resistance of social pressures, such as body ideals created by the Western sociocultural context, could be utilised in a collective setting to initiate social change.

As a result of NLH, women enhanced their existing routines as a way to integrate and manage new HPBs. In particular, women noted the importance of making small changes to incorporate positive health changes into their daily lives as an achievable and empowering strategy to address their health. Consistent with previous research (Denham, 2002, 2003; Jastran, Bisogni, Sobal, Blake, & Devine, 2009), routines were identified as repetitive behavioural, affective or cognitive sequences that occurred either consciously or unconsciously. Not only did routines support women to achieve their HPBs, but women noted that the iteration of routines supported them to *experience* the benefits, which nurtured a sort of reflexivity regarding the interplay between HPBs and their individual and dynamic context (*health literacy, creating routines*). Similarly, Jastran et al. (2009) found that participants from their study actively performed routines as a way to balance personal food choice with contextual constraints and thus enabled sustained behaviours amidst external demands. Findings from NLH highlight that women's awareness of this interaction between self and context was an essential form of knowledge that empowered women to manage and improve their health in a sustainable way. Other researchers identify routines as a way to manage health behaviours such as food choice (Jastran et al., 2009), feeding children (Agrawal, Farrell, Wethington, & Devine, 2018), sleep hygiene (Buxton et al., 2015) and disease management (Crespo et al., 2013). Denham (2003) suggest that routines can be explored to understand one's health knowledge, behaviours, beliefs and how to incorporate health behaviours. NLH contributes to the existing literature by demonstrating that not only do routines enable sustainable changes to health behaviours because of how they fit into daily life, but also hold potential to generate a sense of accomplishment throughout the day (*self-actualisation*). Whereas previously women may have required time and motivation intensive activities to feel achievement (e.g., 45-minute workout, eliminating sources of added sugar), following NLH, a

small frequent routine (e.g., going for a short walk during lunch, opting to bring healthy snacks to work) entailed fewer barriers. This shift was evident from women's recollections of transition from an "all or nothing approach" to one that focused on small changes in daily life. Thus, women achieved small goals at a higher frequency, which was more sustainable and consequently contributed to greater feelings of success. However, some of the women noted difficulty making sustainable changes to their behaviours through routines despite their flexibility. Agrawal et al. (2018) report that predictability is an important factor in supporting health behaviour change through routines. While NLH reports promising findings that support routines to enable sustainable behaviour change, further research is warranted to explore how to best support women whose contexts are driven by unpredictability, such as mothers and shift-workers.

Women described shifting from a failure-oriented mindset to a positive perspective that emphasised their strengths and achievements. In particular, recognising their progress as small steps forward created a greater sense of progress and contributed to their improved self-worth. This shift had a positive effect on women's development of positive self-image and an intrinsically motivated health practice. Given that the Western sociocultural context fosters feelings of failure and internalised self-blame through the dissemination of unrealistic aims for beauty and health (E. Miller & Halberstadt, 2005; Pfister et al., 2017; Strömback et al., 2014; Tylka et al., 2014), women's transition towards focusing on their strengths and small achievements is critical. While women demonstrated improved self-perception beyond NLH, they did not sustain significant improvements to their body dissatisfaction. Positive and negative body image are distinct in that the former is more than the absence of negative body image and vice versa (Tylka, 2012; Tylka & Wood-Barcalow, 2015b). Thus, while NLH likely contributed benefits to building a positive body image, it may not have directly address factors related to negative body image, such as negative affect, or the experience of negative emotions (McCabe, Ricciardelli, & Banfield, 2001). Future research needs to explore ways to address women's existing presence of negative body image through critical health education regarding the social determinants of poor body image.

The findings collectively suggest that women were empowered over their health following NLH. Empowerment is complex and difficult to assess as an outcome given the role of context in the concept (Shearer, 2004, 2009; Shearer & Reed, 2004). Moreover, there is little consensus among the current literature of how empowerment presents as an outcome (Lindacher et al., 2018). Nevertheless, under health empowerment theory, empowerment entails that women can gain greater control over their health by realising personal and contextual resources and their integration into women's individual circumstances (Shearer, 2009; Shearer & Reed, 2004). Based on this conceptualisation of empowerment, the results collectively suggest that women were empowered by increasing their capacity for HPBs, adopting and experiencing a holistic health approach and enhancing their autonomy regarding their HPBs, health development and ability to generate a sense of success. NLH offers promising insights in its contribution to empowering women over their health, which is encouraging for women living in a disempowering Western sociocultural context.

## NLH Process Evaluation

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After addressing the outcomes that women experienced, Chapter Seven proceeds by presenting the results regarding the implementation of NLH. The process evaluation results are based on data from the 58 women who completed all seven monthly meetings and the NLH Evaluation Form at post-intervention. The process evaluation results include findings for reach, fidelity and participants' satisfaction regarding NLH. Chapter Seven concludes by summarising the observed results from the process evaluation in preparation for discussion in the following chapter.

## **Reach**

### *Reasons for Participating*

Women primarily participated in NLH to improve their health (Table 14). More specifically, women joined NLH to accomplish particular health aims (e.g., increase physical activity, personal development, weight-loss), gain external support or learn more information to develop their health. Aside from health improvement, women also reported external factors as reasons for their enrolment such as their familiarity with others involved in the programme or that NLH required low investment for cost and time.

Table 14

*Women's Reasons for Participating in NLH*

<b>Theme</b>	<b>Reason</b>	<b>Code</b>	<b>Example Excerpt</b>
Improve health	Specific aims to improve health	Improve specific health areas	<p>“There's a couple of things I definitely know I have to work on.”</p> <p>“Probably just exercising a bit more as well and finding myself.”</p> <p>“Maybe help some of the weight that I'm carrying.”</p> <p>“I'm not very healthy, and I'm not very fit and I really need to do something about it.”</p> <p>“I know that I need to make a big change for me... my mom had a heart attack this year and my dad's also had angina and a triple by-pass... so I've really got to make some changes... I gained 20 kilos um since sort of starting masters so.”</p>
		Weight-loss Make a change	
	Seek support to improve health	Accountability	<p>“I really struggle to kind of motivate myself and I need that little, external kind of motivation to kind of push you into doing something... it's almost like I'm doing it for someone else, not just myself”</p> <p>“It's always good to have any outside input or help with getting healthier because it's really hard to do on your own.”</p> <p>“I don't really know what I need to do for myself and where to begin.”</p> <p>“... maybe doing something like this would be a good way of guiding me... how to do it but like also drawing on what I already know as well.”</p>
		Seeking guidance	
Learn more to develop health		Optimise current health and knowledge	<p>“I think you can always improve where you're at, always learn something new.”</p> <p>“... like knowing more about my body and um I think I could certainly be healthier”.</p> <p>“I'll try anything for my health or body... I want to try everything because I'm really curious...”</p> <p>“It [NLH] will be a chance to have a closer look at how I can improve how I'm living and what I'm doing to keep healthy.”</p> <p>“It will be a good opportunity for me just to really reassess where I'm at.”</p> <p>“...body fat percentage and you know just make sure that clinically I'm alright if that makes sense? Like when my blood pressure gets low, that annoys me and I want to know why is that, you know?”</p> <p>“...the way that it [NLH] was looking at all aspects of health so it's not a fitness programme in itself it's... you know... A little bit of everything.”</p> <p>“I think the focus health being more like holistic for women rather than just being focused on weight”</p> <p>“...I was quite curious to see some more of the holistic approach to it because as I've gotten older, having been an athlete, a competitive athlete, a body builder, run a marathon... [I'm] becoming aware that my, for me, it's not just about the physical. It's a more holistic approach to it and I think for women's health and women's issues in general is that we focus so hard on the physical, we don't look at anything else and it's really demoralising.”</p> <p>“I like the idea of lasting change instead of obsessing about exercise for a month, or a week and then ignoring it for a month or a week.”</p>
		Evaluate current practice	
		Evaluate current health	
		Holistic approach	
		Weight/appearance-neutral approach	
External factors		Sustainable change	<p>“I've got a friend doing it...”</p> <p>“Because you're really nice!”</p> <p>“...doing research, myself, understanding how awesome it is to have participants... wanting to... help in that way...”</p> <p>“...it's not very often you get to participate in something like this unless you're going to really invest time and money into it. But also, because I think I can benefit from the programme as well like um.”</p>
		Friend participating	
		Comfortable with the facilitator	
		Help as a participant	
		Low investment	

# Fidelity

## *Adherence*

Fifty-eight women completed NLH through to post-intervention demonstrated an adherence rate of 96.7%. Furthermore, the 58 women completed all seven of the monthly meetings. The women provided highest ratings for their *mentor* and the *monthly check-ins* as the key components that supported their adherence to the programme (Table 15). Two women discontinued the programme based on reasoning of “too busy.”

Table 15

### *Women’s Ratings for Programme Components that Aided Adherence*

<b>Programme Component</b>	<b>Median [25<sup>th</sup>, 75<sup>th</sup> Percentiles]</b>	<b>Range</b>
Mentor	5.0 [5, 5]	4.0 – 5.0
Monthly check-ins	5.0 [4, 5]	2.0 – 5.0
Weekly Checklists	3.0 [2, 5]	1.0 – 5.0
Goal printouts	4.0 [3, 5]	1.0 – 5.0
Personal planning	4.0 [4, 5]	2.0 – 5.0
Appt. reminder texts	4.0 [3, 5]	1.0 – 5.0
Mid-monthly support texts	4.0 [3, 5]	1.0 – 5.0
Facebook group	4.0 [4, 3]	1.0 – 5.0

*Note.* Rating scale ranged from ‘1’ (not helpful at all) to ‘5’ (very helpful).

*n* = 57 due to an incomplete evaluation form.

<sup>a</sup>Missing data (*n* = 56).

## *Level Progression*

On average, women completed 29.6 (3.60)<sup>4</sup> out of 36 possible levels at post-intervention (Table 16). The total number of levels women reached ranged between 19 to 36 levels; only one woman managed to reach all 36 levels. Women were most successful at progressing through stress management levels averaging 5.57 (0.65) levels upon completing NLH.

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<sup>4</sup> Means are presented as Mean ( $\pm$  Standard Deviation).

Table 16

*Women's Mean Level Completion at Post-Intervention*

<b>Health Category</b>	<b>Mean (SD)</b>	<b>Range</b>	<b>Rate of level progression (per month)</b>
Physical activity	4.72 (0.87)	3.00 – 6.00	0.79
Sleep	4.78 (1.01)	3.00 – 6.00	0.80
Nutrition	4.97 (0.97)	2.00 – 6.00	0.83
Eating behaviour	4.93 (1.02)	2.00 – 6.00	0.82
Self-care	4.62 (0.91)	3.00 – 6.00	0.77
Stress management	5.57 (0.65)	4.00 – 6.00	0.93
Total	29.6 (3.60)	19.0 – 36.0	4.93

*Note.* Six levels were possible for each category (36 total possible for all categories). Level progression rates are shown as the average number of levels women completed over six months.

Women's advancement through NLH varied considerably exhibited by the diverse rates women progressed through the levels under each of the six HPB categories (Figure 20). During NLH, women often reported that some HPB categories varied in difficulty compared to other categories. For instance, one woman may have progressed quickly through physical activity levels due to her existing exercise routine but found sleep levels such as winding down and avoiding technology before bed more challenging and thus exhibit slower for progression.

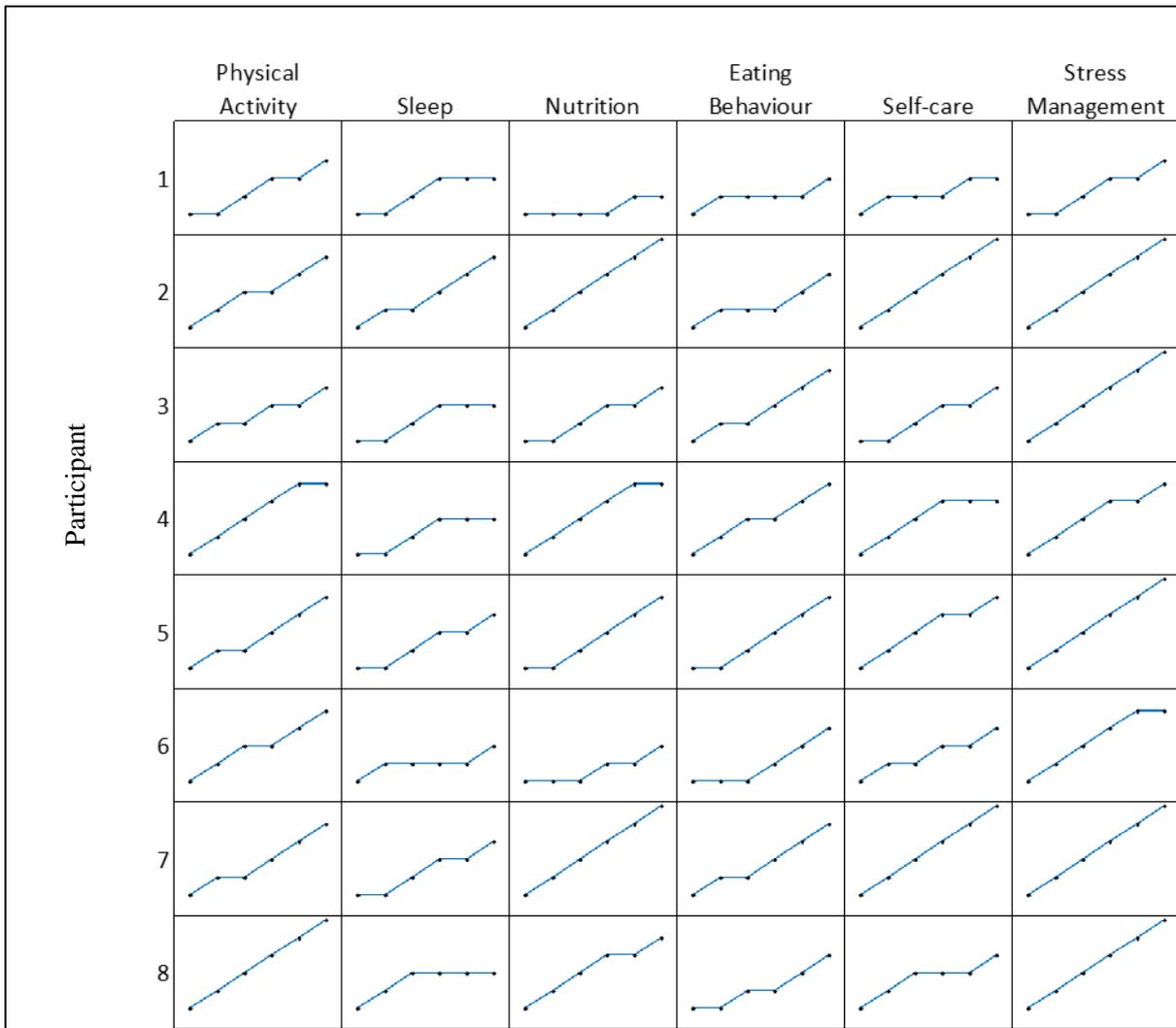


Figure 20. Level progression for eight individual women over the course of NLH.

The progression across each of the six levels is depicted for each of the eight participants (to view the progressions for all 60 women, refer to Appendix Z). An increase to a higher point represents progression to the next level (e.g., participant two increased from level 1 to level 2 in the first month) whereas a static line represents women’s repetition of a level for the next month (e.g., participant one at level 1 for the first two months).

Intra-individual variation for level progression was also evident by an individual’s advancement through a single HPB category. During the monthly meetings, women described how the levels in a single HPB category ranged in difficulty. Varying life events were also a factor for women’s level progression. For example, atypical circumstances (e.g., travel, new semester classes or work schedule) often disrupted women’s progression for new monthly goals. Following a strengths-based approach, maintaining previously attained goals (from prior levels) was still considered progress even if they did not achieve their new goals and advance to the next level. In

such cases, women adjusted their plans accordingly to re-attempt their most recent goals. Thus, women progressed for HPB development even if they did not advance to the next level within an HPB category. Hence, women's individual progression was highly varied based on their experience for levels, HPB categories and unique contextual circumstances.

While women varied in their progress through individual HPB categories, each woman's journey through NLH was also unique to their experience and interests. For example, a woman who was used to prioritising time for herself advanced more quickly through self-care levels as opposed to a woman who was not. Furthermore, a woman who was already adept at multiple areas of health (e.g., existing exercise routine, sleep routine, planning and preparing meals, thinking about her stressors) would progress at a faster rate through multiple HPB categories compared to a woman who was less familiar the same health behaviours. Thus, aside from contextual factors, women's existing abilities upon entry to NLH may explain the varied rates women progressed for individual HPB categories and overall levels across the six HPB categories. Regardless of the rates women progressed, all women demonstrated level progression.

### *Motivational and Reminder Text Messages*

Text messaging for appointment reminders and motivational texts were successful for the majority of participants (n = 56). Two women preferred to receive their motivational texts and appointment reminder messages via email.

### *Social Media Engagement*

All 60 women joined the Facebook group to access the NLH support community. Additionally, two of my supervisors and I joined the group as administrators to observe participant interactions and manage the group. Figure 21 describes women's engagement with the Facebook group throughout the duration of NLH.

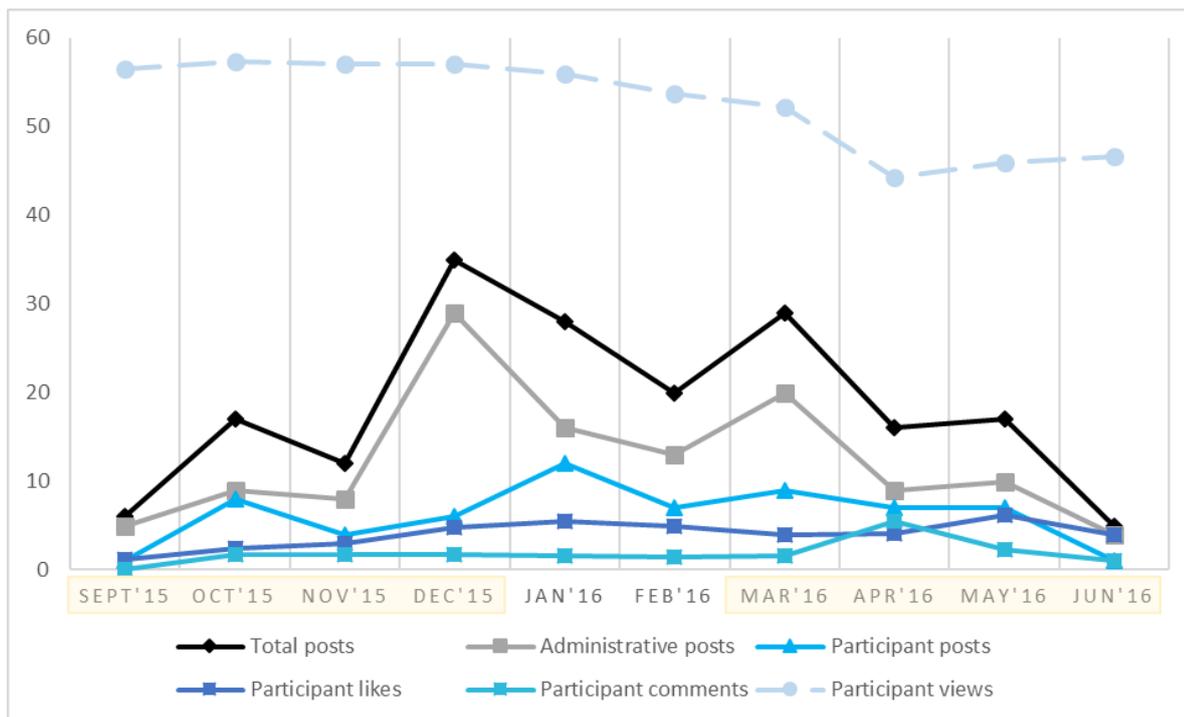


Figure 21. Women's engagement with the Facebook group throughout NLH.

The blue lines represent participant interactions, while the administrative posts are depicted in grey. The black line represents the overall number of posts to the Facebook group inclusive of both participants and administrators. Posts were reported as the total posts per month, while other interactions (comments, likes and views) were averaged across the number of posts for that given month. Active engagement is signified by solid lines, while the dotted line (i.e. views) represents passive engagement. The highlighted months indicate the time periods that women enrolled (Sept'15 to Dec'15) and finished (Mar'16 to Jul'16) NLH.

Overall, the Facebook page received a total of 185 posts ( $n = 123$  administrative posts,  $n = 62$  participant posts) over the course of 10 months. On average, participants posted 6 (3.4) times per month, while the administrators shared an average of 12 (7.6) posts per month. The posts received an average of 4 (1.5) likes and 2 (1.4) comments from participants. Thus, women's active engagement with the Facebook group was relatively low but consistent as depicted by Figure 21. The posts received an average of 55 (5.2) unique participant views throughout NLH, meaning that the majority of women consistently interacted with group by passively engaging.

The posts were thematically categorised as informational, personal HPB examples, question posts or other. "Informational" posts were posts ( $n = 112$ ) that were educational or provided ideas for HPB goal achievement (Figure 22). Posts were also classified as "personal HPB examples" ( $n = 73$ ) when a participant or administrative personal shared examples of their

own HPBs (Figure 23). “Question” posts (n = 5) comprised questions from administrative staff or participant seeking information or ideas from the group (Figure 24). “Other” posts (n = 7) tended to be administrative posts relating to NLH logistics (e.g. sharing extra copies of weekly tracking lists). Administrators tended to share informational posts (n = 76) and personal HPB examples (n = 40). Women often shared personal HPB examples (n = 33) and informational posts (n = 33). Examples are provided of how participants utilised the Facebook group as a source for motivation and source of support from others (Figure 25).

### Informational post (administrator)

November 16, 2015 · Add Topics

Few suggestions for exercises to incorporate in your daily routine, try doing 20 squats while you brush your teeth or when you're on the phone

## Squats

- Both feet are on the ground, shoulder width apart.
- Keeping your weight on your heels, with your knees pointed straight forward, slowly lower the body by bending through the hips, knees, and ankles.
- Stop when your knees reach a 90-degree angle or have gone over your toes.
- Push through your heels to straighten back to a standing position.

If this is difficult, hold on to a chair to maintain balance, it can be done as a chair sit, where the squat until the butt touches a chair and then lifts back up. Or as a wall squat with the swiss ball behind you.

**Progressing the exercise:**

- Using dumbbells
- Using a bar

**Progressing the exercise:**

- Complete the balance task with your eyes closed.
- Bend at the waist, extending the leg that is in the air
- Have a partner stand behind you. Lean slowly towards the person, then the person gently pushes you forward
- Both you and your partner stand on one leg. Chest pass the ball between you.

2 · Seen by 59

Like Comment

shared a link.

March 7, 2016 · Wellington · Add Topics

I've got a noisy mind on a busy Monday! Looking for a little quiet and focus in your day? Try getting 10 min using the headspace app. (The to [redacted] and a couple others for sharing 😊)



HEADSPACE.COM  
**Headspace** ✓

Get your Headspace wherever you go with our Meditation App for your mobile, available for iPhone & Android. Sign up for free today!

1 Comment · Seen

Like Comment

### Informational post (participant)

November 19, 2015 · Add Topics

Some easy but useful tips to be a sleeping beauty 😊



NUTRITIONSTRIPPED.COM

## The Ultimate Nighttime Routine for Better Sleep

The Ultimate Nighttime Routine for Better Sleep is a guide to getting better

and 3 others · 2 Comments · Seen

Like Comment

you could add cuddling with puppies to your sleep ritual

Like · Reply · 2y

Wait, does that mean you're providing us all puppies?!! 😊

Like · Reply · 2y

shared a photo.

March 8, 2016 · Add Topics



REMEMBER TO SAY SOMETHING NICE TO YOURSELF TODAY!

Amy Poehler's Smart Girls

March 8, 2016

Like Page

and 4 others · Seen

Figure 22. Examples of “informational” posts in the social media group

Personal HPB post (administrator)

what is something small that makes you proud to wrap up the year? I may be on the go and out of my routine but I've got my road tripping snacks! 🍌  
 #emergencyfoodstores #hawkesbayfruitstands #strawbsandpeaches #fibrefordays #neckstretchesinthecar



and 5 others 2 Comments Seen by 55

Like Comment

I've been helping mum in the garden for my social physical activity 😊

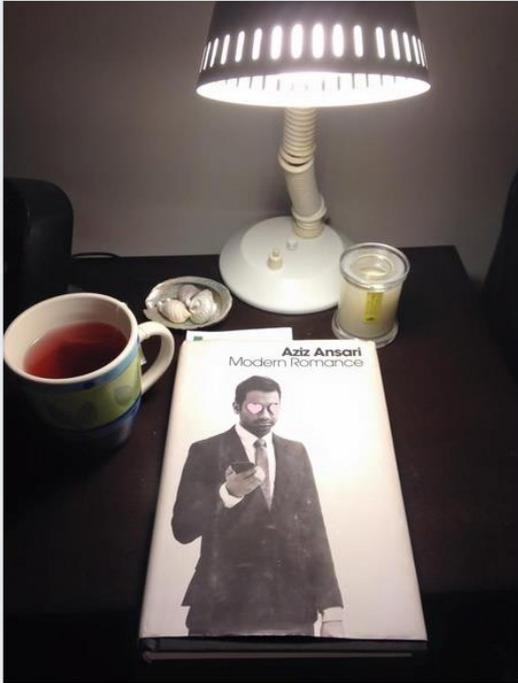
Like Reply 2y

There's 17 of us staying in the one place since the 29th, at my brother-in-law's. My small pride is that I was pushy about my desire to make an all-veg meal myself despite my partner's concerns about it being anti-social, and his mum's worries about kitchen-space with so many people to accommodate. To get around it, my partner and I prepared vege wraps for 17, with beef available for those who wanted it.

Like Reply 2y

February 8, 2016 · Add Topics

Winding down and shutting everything off for the night. One way to keep your techy evenings can be reading about it 😊 sleep tight ladies!



others 2 Comments Seen by 57

Like Comment

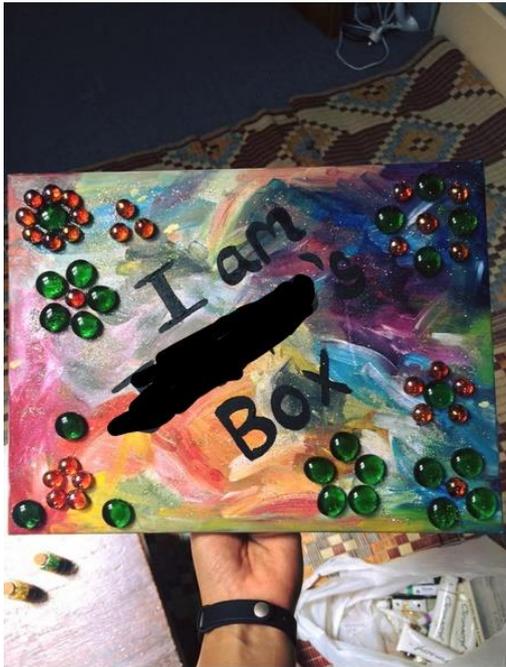
Personal HPB post (participant)

December 25, 2015 · Add Topics

There's always a battle with achieving your goals in the busy holiday sea No excuses for me this morning, talked myself into running stairs even though it's Christmas. Happy holidays everyone!!



For me, self care is more fun with rainbow flower sparkles. Feeling like I'm 5 again with a wacky tacky new lid for my arts and crafts box



and 6 others 2 Comments Seen by 57

Like Comment

I'm totally down with flower sparkles. Awesome!

Like Reply 2y

Figure 23. Examples of “personal HPB” posts in the social media group

### Question post (admin)

April 28, 2016 · Wellington · Add Topics

Hey ladies!! How are you doing today?? Tell me one good thing you did for your health today 😊 If you can't think of anything, there is still time in the day to do something you're proud of! Keep it small! I challenge you to post something by the end of the day 😊



1 10 Comments · Seen by 53

I'll start! Last night I prepped my lunch and snacks for the day (which made for a smooth morning) and stuck to them resisting that tempting cafe across the road 😊 Woo hoo, gold star! Your turn!

Like · Reply · 2y 1

I finished my water bottle! Wooooo!

Like · Reply · 2y 3

Yeahhhh!!!!

Like · Reply · 2y

Same! 😊

Like · Reply · 2y 1

Write a reply...

I went for a walk at lunchtime!

Like · Reply · 2y 1

Taking time away from essay writing to go play footy tonight, yay!!

Like · Reply · 2y 1

Going to barre class tonight 🍷🍷

Like · Reply · 2y 2

Took a break from writing to take a dog for a walk

Like · Reply · 2y 2

I went to a morning yoga class, I was the only one who showed up so woohoo private lesson 😊

Like · Reply · 2y 2

I chose grapes instead of chips for a snack today. 😊

Like · Reply · 2y 2

Koha yoga class in Spanish!

Like · Reply · 2y 1

I had a bowl of fruit instead of ice-cream at a work afternoon tea

Like · Reply · 2y 2

Write a comment...

### Question post (participant)

November 19, 2015 · Add Topics

Anyone got any good healthy cheap easy lunch ideas?

3 Comments · Seen by 59

Like · Comment

Do you have a fridge at work? I'm buying a pack of pita and some sprouts, a tomato, tuna or ham, and some cheese slices. I keep it all in the fridge and make them fresh for lunch each day ... That I don't have meetings or something else on. I think it works out to three or so dollars a day.

Like · Reply · 2y 2

Yep I do great idea thanks!

Like · Reply · 2y

Nice 🍷 Joanna Matthew! I was going to say something similar - good time saver and nice and fresh 😊 Another tip would be switching between making salads, wraps and sandwiches with the same ingredients to keep it interesting!

Like · Reply · 2y 1

Write a comment...

Figure 24. Examples of “question” posts in the social media group

Posts as motivation  
(participant)



Posts as motivation/support seeking  
(participant)



Figure 25. Example posts as “motivation/support seeking” via the social media page

## Participant Satisfaction

### *HPB Categories*

Women’s ratings for all HPB categories were higher than *somewhat helpful* (Table 17). Median ratings suggest that the majority of women participating in NLH found each of the HPB categories to be helpful for their health development. Women rated the eating behaviour and stress management categories as the most helpful for their health development compared to the other categories.

Table 17

*Women’s Satisfaction for the Six HPB Categories*

<b>HPB Category</b>	<b>Median [25<sup>th</sup>, 75<sup>th</sup> Percentiles]</b>	<b>Range</b>
<b>Physical activity</b>	4.0 [3.0, 5.0]	2.0 – 5.0
<b>Sleep</b>	4.0 [4.0, 5.0]	2.0 – 5.0
<b>Nutrition</b>	4.0 [4.0, 5.0]	2.0 – 5.0
<b>Eating behaviour</b>	4.5 [4.0, 5.0]	2.0 – 5.0
<b>Self-care</b>	4.0 [4.0, 5.0]	1.0 – 5.0
<b>Stress management</b>	4.5 [4.0, 5.0]	1.0 – 5.0

*Note.* Women HPB categories were rated based on ‘helpfulness for health development’. Ratings ranged from ‘1’ (not helpful at all) to ‘5’ (very helpful). HPB = health promoting behaviour.

### *Enjoyed about NLH*

All 58 women had something positive to say about NLH (Table 18). In particular, women most frequently reported their enjoyment for the monthly meetings with their mentor and goal setting. Women noted that the monthly meetings with their mentor provided both accountability and a supportive space where women could discuss and reflect upon their health. In regard to goal setting, women particularly enjoyed setting achievable goals and seeing their progress as they attained them. The NLH framework and individual focus were also points of satisfaction among participants. Specifically, women enjoyed that the NLH framework was multidisciplinary and adaptable to their personal circumstances. Some of their comments revealed that the programme’s focus on multiple areas supported them to experience new health-related activities and continue to experience progress, even if one of the health areas was a barrier. Additionally, women reported enjoyment for dedicating time to and learning about their unique relationship with health.

Table 18

*Themes of What Women Enjoyed About NLH*

NLH Component	n	Descriptor Codes	Meaning Unit Examples
Monthly meetings w/ mentor	28	<ul style="list-style-type: none"> <li>Positive encouragement</li> <li>Non-judgmental</li> <li>Discuss achievements and barriers</li> <li>Reflecting on goals</li> <li>Accountability</li> <li>Responsive/adaptive scheduling</li> </ul>	<p>“[Mentor] was always encouraging and motivating, especially when you did not achieve all of your goals that month.”</p> <p>“You [mentor] are so encouraging and always left me feeling good about myself.”</p> <p>“Meeting with [mentor] and getting her positive energy about things I had done, which made me feel good about some of the really small things I did and had the opinion that it wasn’t good enough.”</p> <p>“... did not feel intimidating and I felt free to discuss.”</p> <p>“Helped to keep me accountable and assess how I was going and what I could do about barriers.”</p> <p>“Support - great to talk through what is easy and harder.”</p> <p>“...built in opportunity every month to reflect on my health.”</p> <p>“...good communication re: appts... and flexibility.”</p>
Goals	23	<ul style="list-style-type: none"> <li>Achievable</li> <li>Seeing progress</li> <li>Challenge</li> <li>Adaptable to existing routine</li> </ul>	<p>“I liked the small goals – it broke down real life changes into realisable tasks and struggle in one area didn’t impede overall progress.”</p> <p>“Feeling happy with myself when reaching them [goals] and even if I didn’t reach still happy because it’s moving in the right direction.”</p> <p>“...a lot could be seen as fun challenges, either by the task or the opportunity to improve on something in need.”</p> <p>“...tailored to ‘me’ specifically achievable goals worked into my current lifestyle.”</p> <p>“The goals were really great at being both guided by the programme and personal.”</p>
NLH Framework	17	<ul style="list-style-type: none"> <li>Multi-component system</li> <li>Progressing through levels</li> <li>Adaptability</li> <li>Trying new ideas</li> </ul>	<p>“I especially enjoyed how 6 areas of health were covered – changes permeated through many aspects of my everyday life.”</p> <p>“...struggle in one area didn’t impede overall progress.”</p> <p>“The challenges in moving up levels and building on things, sense of making progress was satisfying.”</p> <p>“I think this system is flexible and workable and can be used for a large range of people.”</p> <p>“Fits easily in my life.”</p> <p>“Learning new ideas and ways in which I can improve my health I hadn’t done or even know about before.”</p> <p>“...trying new cooking methods and meals.”</p>
Individual focus	15	<ul style="list-style-type: none"> <li>Time for self</li> <li>Self-evaluation</li> <li>Self-development</li> <li>Personalised</li> </ul>	<p>“I enjoyed dedicating time to thinking about myself.”</p> <p>“Exploring my attitude towards my overall health and developing more awareness of how I perceive myself.”</p> <p>“Challenging myself to improve my health.”</p> <p>“Programme focussed specifically on and my life/ways...”</p>
Strengths-based approach	7	<ul style="list-style-type: none"> <li>Positive perspective</li> </ul>	<p>“I enjoyed learning how to live a happier life and how to enjoy physical activities.”</p> <p>“Being in the programme made me feel positive about my health.”</p> <p>“I enjoyed feeling like I was being proactive about my health and wellbeing. “</p> <p>“Gave me the reasons to be positive.”</p> <p>“I liked the little goals I was able to achieve and the positive approach.”</p>
Holistic health focus	9	<ul style="list-style-type: none"> <li>Beyond diet and exercise</li> <li>Attention to multiple aspects</li> </ul>	<p>“...it helped me look at myself as a whole person and want to look after myself rather than just focusing on my eating and exercise.”</p> <p>“It motivated me to improve all aspects of my health.”</p>
Support group	4	<ul style="list-style-type: none"> <li>Community</li> </ul>	<p>“...really enjoyed the Facebook group. Helped feel a part of a community.”</p>
Other factors	2	<ul style="list-style-type: none"> <li>Motivational texts</li> <li>Testing sessions</li> </ul>	<p>“...the mid-month motivational texts.”</p> <p>“I enjoyed the testing – it was interesting.”</p>

*Note:* Summary is based upon 58 women who completed NLH and reported at post-intervention. Count does not add up to 58 because women may have reported multiple comments.

### *Disliked about NLH*

At post-intervention, women also reported aspects of NLH that they disliked (Table 19). Women predominantly reported their dislike for factors related to the testing sessions and required equipment for NLH outcome assessment (n = 16). Women often reported ‘nothing’ that they disliked (n = 11). Several women described disliking aspects of the NLH framework (n = 8) and the goals (n = 7). Specifically, some women stated that some aspects of the framework lacked relevance for them since they already had high achievement in that particular categories or had limited opportunity for eating behaviour goals such as meal preparation. Women reported finding some areas (i.e. nutrition, self-care and sleep) to be difficult at times. Another woman reported that the self-care and stress management categories seemed to overlap. Women also mentioned feeling guilty or discouraged at times when they did not meet their goals. One woman described having trouble keeping up or losing track with her many goals as she progressed through the programme.

Table 19

*Themes of What Women Disliked about NLH*

NLH Characteristic	n	Descriptor Codes	Meaning units
Testing sessions/equipment	16	<ul style="list-style-type: none"> <li>Arm band</li> <li>Testing requirements: Step test, duration, waiting for feedback</li> </ul>	<p>“Not very keen on the band.”</p> <p>“The step test – too high and awkward to move to sound.”</p>
Nothing/don't know	11	<ul style="list-style-type: none"> <li>Nothing</li> <li>Don't know</li> </ul>	<p>“Nothing. It was a great programme.”</p> <p>“Can't think of any now.”</p>
Goals	8	<ul style="list-style-type: none"> <li>Lacking relevance</li> <li>Not achieving goals</li> <li>Hard to keep up</li> </ul>	<p>“I couldn't make my own goals. I had things in each health category that I'd like to work towards but I had to choose from a list of the programme goals at each stage. Some of these weren't helpful for me or relevant to my health now.”</p> <p>“Only really disliked not meeting my own goals sometimes...”</p> <p>“Often felt discouraged if I set my expectations too high but again I learned how to set realistic goals.”</p> <p>“At times I found it hard to keep up with all the goals I'd set myself. Some got a bit lost on the way.”</p>
NLH framework	7	<ul style="list-style-type: none"> <li>Topics did not appeal</li> <li>Lacking relevance</li> <li>Difficult areas</li> <li>Some areas overlapping</li> </ul>	<p>“Some of the progressions didn't really appeal to me even through I know they improve health.”</p> <p>“Some of the criteria didn't fit with me as I could only cook one meal a week with my flat.”</p> <p>“The self-care and stress management were a waste of time for me... my goals in those two areas were things I already did.”</p> <p>“I sometimes found the food and self-care goals difficult, but I enjoyed it when I met them.”</p> <p>“I found some of the options to be too similar/overlapping (self-care vs. stress management). This was confusing and seemed to ‘double dip’.”</p>
Monthly meetings	4	<ul style="list-style-type: none"> <li>Inconvenient</li> <li>Duration</li> </ul>	<p>“It's a little out of my way to come to the location every month.”</p> <p>“Going over the next weeks possible goals in a lot of detail before deciding on the goals took quite a bit of time.”</p>
Programme duration	3	<ul style="list-style-type: none"> <li>Too short</li> <li>Too long</li> </ul>	<p>“Perhaps it went slightly too quickly. I feel some goals 2 months would have been more useful (and indeed it took 2 months to cement).”</p> <p>“Maybe amount of time spent on it.”</p>
Weekly checklists	4	<ul style="list-style-type: none"> <li>Unmanageable</li> </ul>	<p>“In the first few months the tick box for each goal each day was helpful but it became annoying and unmanageable, so I started doing it mentally.”</p>
Facebook page	3		<p>“I didn't participate on the Facebook page.”</p>
Impact on social life	1		<p>“Was sometimes hard to articulate to others what the purpose of different goals were, having to explain I can't buy lunch or have that cup of tea.”</p>
Text messages	1		<p>“Text messages were cute but unnecessary.”</p>

*Note:* Summary is based upon 58 women who completed NLH and reported at post-intervention. Count does not add up to 58 because women may have reported multiple comments.

### *Recommended Improvements for NLH*

Table 20 outlines the suggestions that women provided to improve NLH. Apart from women who did not provide recommendations for improvement (n = 13), women predominately advised increasing personalisation of the NLH framework (n = 9) and modification to the weekly tracking lists (n = 8). To further personalise NLH, women suggested widening selection to any topic across the HPB categories, while others proposed including a ‘miscellaneous’ option so that they could provide their own small goals. Women also recommended modifying the monthly goal paperwork into an app for increased convenience and to simplify tracking their accumulating goals. Several women ( n = 5) also suggested creating opportunities to meet other women participating in NLH to enhance community beyond the Facebook group. Others mentioned that increasing the clarity surrounding particular goals (i.e. self-care, stress management and physical activity) would improve the programme.

Table 20

*Themes of Women's Recommended Improvements for NLH*

NLH Characteristic	n	Descriptor Codes	Meaning Unit Examples
Nothing	13	<ul style="list-style-type: none"> <li>Nothing</li> <li>Not sure</li> </ul>	<p>"Can't think of anything!"</p> <p>"Not sure to be honest."</p>
Enhance personalisation of small goals	9	<ul style="list-style-type: none"> <li>Increased freedom</li> <li>Greater variety for options</li> </ul>	<p>"Some goals... I was already doing. Perhaps there could be more goals to select from e.g. different focusses for the week e.g. sodium or fat or sugar, etc."</p> <p>"Include 'misc./general' at the end of the list for people to create their own goal for the different categories."</p>
Modify monthly checklists and printouts	8	<ul style="list-style-type: none"> <li>An app</li> <li>Objective surveillance</li> <li>Digital copy of goals</li> <li>Simplify goal tracking</li> <li>More room for notes</li> </ul>	<p>"An app on my phone as a reminder and help to track progress?"</p> <p>"Maybe more surveillance on the participants in terms of their progress and whether they are actually reaching goals."</p> <p>"A digital copy of weekly checklists would be great too."</p> <p>"I would have liked an easy way of tracking previous goals along with new ones. Maybe not all, but perhaps a sheet with space for 3 levels of goals."</p> <p>"The sheets should have partially complete because you may do most of the activities set out but may only miss one thing on it and it may help to keep up moral."</p> <p>"Making room for more notes."</p>
Enhance community	5	<ul style="list-style-type: none"> <li>Meeting others in person</li> </ul>	<p>"Maybe meeting one or twice to network."</p> <p>"More engagement with the forum – maybe make it in-person (where possible) rather than just online. To create a stronger community."</p> <p>"Maybe a meet and greet for all the participants at the beginning of the course. This would put names on the FB group and perhaps add another level of encouragement for goal completion."</p> <p>"Would probably benefited from more interaction with other participants/mentor."</p>
Greater clarity/instruction for goals	5	<ul style="list-style-type: none"> <li>Clarity</li> <li>Goal specific information</li> </ul>	<p>"Stress mgmt./self-care seemed a bit 'fluffy' and arbitrary at times. More 'solid' goals would have been helpful or little things daily vs. 30-60 min/week."</p> <p>"Maybe some exercises could be recommended – specific stretches, how to do them, resistance and weights... hard to know where to start."</p> <p>"More information/ a print out of why we need to do certain things."</p>
Adjust NLH progression	4	<ul style="list-style-type: none"> <li>Shorter</li> <li>Placement test</li> <li>Fewer goals at a time</li> <li>Fort-monthly meetings</li> </ul>	<p>"Less time."</p> <p>"I think an initial questionnaire that figured out what people were already doing in each area and supported them to level up from there would be more valuable."</p> <p>"Maybe less emphasis on getting to the next goal probably could work on fewer [goals] to consolidate things at once."</p> <p>"Could run for a year with check-ins and goal setting every other month."</p>
Expansion	3	<ul style="list-style-type: none"> <li>As an app</li> <li>For males</li> <li>Development</li> </ul>	<p>"An app!"</p> <p>"I would love to see the same programme applied for all genders... males would gain from this also!"</p> <p>"It's a great programme... NLH should get more resources and funding."</p>
Miscellaneous	2	<ul style="list-style-type: none"> <li>Convenience</li> <li>Incentive</li> </ul>	<p>"Skype meetings? Face-to-face however was really effective."</p> <p>"Monetary reward for participants time."</p>

*Note:* Summary is based upon 58 women who completed NLH and reported at post-intervention. Count does not add up to 58 because women may have reported multiple comments.

## Process Evaluation Summary

Women primarily participated in NLH with aims to improve their health. The 58 women who completed the programme attended all seven monthly meetings. In particular, women noted that their mentor and the monthly check-ins supported their adherence to NLH. As a group, women progressed through the majority of NLH levels for each of the HPB categories, their quickest advancement being through stress management. Women's advancement through NLH was highly varied at the intra- and inter-individual level. The majority of women rated each of the HPB categories as helpful for their health development. While women's engagement with the social media support group tended to be passive by viewing posts, the participants consistently engaged throughout the duration of NLH. When actively posting to the site, women often shared posts that were personal HPB examples or provided information to support other women to achieve their HPBs. Women also utilised this space as a source of motivation and support. On average, the participants noted that each of the HPB categories were helpful for their health development. Women reported that they particularly enjoyed setting goals that were achievable and adaptable to their existing lifestyle, as well as meeting with their mentor that provided positive support and a sense of accountability. Women's dissatisfaction was often reported in relation to the testing sessions or they did not have anything to report. However, some women mentioned their difficulty tracking goals or that areas lacked relevance. Accordingly, women's primary recommendations were to increase choice of NLH goals, modify the monthly goal paperwork to ease tracking and create a stronger community between participating members.

## Discussion of Process Evaluation

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Chapter Eight builds on the outcomes discussed in Chapter Six and further integrates the results observed from the process evaluation (Chapter Seven). Given that the data suggests women were empowered over their health as discussed in Chapter Six, the present chapter seeks to address research objectives: (3) evaluate the impact of programme implementation in terms of its reach, fidelity and participant satisfaction and (4) identify key factors of multidisciplinary health interventions that empower women over their holistic health. Chapter Eight begins by briefly summarising the findings from the process evaluation and proposes eight attributes of the programme that were key to empowering women over their health in contemporary society.

Alongside outcomes, the process evaluation was essential for determining the characteristics for the success of NLH. This thesis sought to explore how a multidisciplinary programme could empower women over their health in a Western sociocultural context. Thus, this section discusses the success of the programme implementation (research objective three) and the key attributes of NLH that contributed to women's empowerment over their health to inform future programmes (research objective four). The process evaluation results clearly indicate the successful implementation of NLH. The majority of women attended the monthly meetings, engaged with the social media support group and progressed through the NLH levels, which signified small goal achievement. The women also reported high satisfaction for the programme surrounding the monthly meetings with their mentor, the small achievable goals and the adaptability of the NLH framework that supported individualised health goals. However, some of the women noted the difficulty of tracking many goals and that the small goals lacked relevance to their lives. Thus, suggested improvements were to increase the personalisation of goals and enhance goal tracking. Upon integrating the findings from women's outcomes and the NLH process evaluation, the present study identified eight key attributes of NLH that were pertinent to empowering women over their health and evaluating the success of women's outcomes. These eight factors were: (1) an emphasis on sustainable change utilising a *small goals approach*; (2) *dialogue* that enabled women to participate in health planning monthly meetings; (3) *social support*; (4) a *multidisciplinary approach* that supported a holistic health practice; (5) a *strengths-based approach*; (6) a *weight-neutral approach* to evaluate women's success; (7) *assessment across multiple health dimensions*; and (8) *mixed-methods* design for evaluation.

***Small goals.*** The goal setting approach in NLH enabled women to adjust goals to their individual circumstances by selecting small goals that were relevant to them, choosing the degree of difficulty and embedding them into their existing routines. Their overall success is demonstrated by an average achievement of 29 small goals based on their mean progression through the 36 levels. Personal variables by which goals are more likely to be attained include making goals relevant, specific, challenging, positive and by being accountable and receiving

feedback (Latham & Locke, 1991). NLH achieved these variables by enabling women to define their own goals, target key health-promoting domains, challenge themselves through gradual change, reflect on their achievements, and meet monthly for a reflection with, and feedback from, the facilitator. Latham and Locke (1991) describe a process known as the “high-performance cycle” (p. 233) in which they hypothesise that combining feedback, task strategies, and rewards with regard to one’s goals can maximise individuals’ success as opposed to simply setting a goal alone. The cycle of setting goals, sharing goals and achievements via social media and monthly meetings, and receipt of positive feedback could have likely led some women into a ‘high-performance cycle’ evident by women’s *self-actualisation*. In particular, setting and mastering goals across the varied domains could have enhanced the likelihood of entering this cycle. Furthermore, women’s rewards for achieving HPBs were self-identified through their own sense of progress and health benefits they experienced. Thus, goal ‘rewards’ were relevant and attainable beyond post-intervention as were women’s achievements for HPBs.

Additionally, women realised how an “achievement” was a fluid concept, as a “small goal” changed over time based on how they were feeling, and the constraints they experienced throughout the month. For example, a small goal might have been a short run one day, while on another day an achievable goal would be walking around the block due to feelings of low energy or time constraints. Latham and Locke (1991) posit that the development of self-regulatory skills is implicit in goal setting when a participant is involved in the process. Since women actively participated in setting and evaluating their own goals in a cyclical process driven by the weekly goals and monthly meetings, the women became practiced at observing their own behaviours and adjusting the variables of their goals accordingly (*health literacy*). Furthermore, women became familiar with this process in relation to the goals they pursued across multiple domains, in varying situations and independently between monthly meetings. Thus, through repeated, participatory goal setting, NLH trained women to develop self-regulatory skills, which supported ongoing outcomes that were achieved independently based on women’s continued improvement for HPB achievement at follow up. A key environmental variable, and challenge, in goal setting approaches

are situational constraints; when the number of constraints is increased, it is theorised that individuals are less likely to attain goals than with less constraints (Latham & Locke, 1991). Yet, NLH showed that goal achievement was still possible despite reasonably high situational constraints in women's lives. Thus, one of the strengths of NLH was the frequency and variety of the goal setting made available in supporting women to achieve their goals.

Although the literature does not support the added benefit of self-defined goals (Locke & Latham, 2002; McEwan et al., 2016), NLH appeared to be particularly successful precisely because of this characteristic in empowering women to gain greater control over their health. Locke and Latham (2002) explain that participatory goal setting is cognitive rather than motivational in that it triggers information exchange and therefore is not in itself a moderator for goal achievement. It is difficult to envision how NLH could have had the same success with fixed goals across the categories, and it would be interesting to explore this contradictory phenomenon found in the literature compared to NLH in more depth. Regardless of this finding, however, participation is central to an ethical and salutogenic practice of health promotion. Thus, interventions that are philosophically informed driven by health promotion values like NLH need to continue their adherence to participatory goal setting. Future research is warranted to further explore participatory goal setting and acknowledge its role in ethical health promotion practice (Carter et al., 2011).

Importantly, the use of small goals worked for a wide variety of "goal achievers." Women had different starting points in their health journey evidenced by their own definitions of manageable goals, reasons for participating in NLH and total achievement for the 31 HPBs. For instance, a small goal for one person meant swapping chips for a side salad, while others were able to experiment with fully vegetarian meals. Women described how focusing on small changes to their current practice broke down health aims into "realisable tasks" that enabled them to shift from an "all or nothing" approach to an "every little bit counts" mindset. Women recalled how focusing on small steps forward, enabled them to step outside of their comfort zones or maintain health behaviours even when their motivation slumped because the small goals still seemed

manageable. Thus, focusing on small, tailored changes supported a more consistent and sustainable approach for women from varying skill sets. Other studies highlight the need for goals that are tailored to individual needs due to variation in preferences and stages of change (Ries et al., 2014). Small goals may provide an opportunity for more balance in the midst of extremes, such as restricted eating or compulsive physical activity (Leong et al., 2013).

Goal variety is an area for future exploration. Some women felt restricted by the available selection of goals and felt that not all domains were relevant to them. Rod, Ingholt, Bang Sørensen, and Tjørnhøj-Thomsen (2014) describe the contention between intervention adaptation and fidelity. Without further adaptation to women's preferences, it is clear that NLH has the potential to be disempowering. However, too much adaptation can leave the programme without definition, which sacrifices fidelity and guidance (Rod et al., 2014). With these considerations in mind, future iterations could provide a miscellaneous option for women to define their own small goals beyond the pre-defined selection. Additionally, women could have the option to progress level topics at an order of their own desire and potentially create a miscellaneous level topic. Such alterations would extend women's freedom to define goals and pursue topics they find relevant to them, yet still provide guidance and structure for NLH reproducibility.

*Dialogue.* The monthly meetings empowered women by supporting their active participation through dialogue. Each month, NLH supported the participants to devise and evaluate their health plans, which was achieved through dialogue between the participant and the facilitator. This exchange enabled women to take ownership over the monthly activities (e.g., reflections and health plans), which embedded their own personal views and values. Holmberg et al. (2018) and Wallerstein and Bernstein (1988) report that dialogue in health interventions is empowering by providing participants the opportunity to contribute their ideas, be heard and impact on decision making, which creates a sense of shared responsibility, mutual respect and sense of self-achievement. The participant perceived outcomes and reasons for enjoying NLH revealed similar notions of self-achievement through learning to design and accomplish goals, feeling mutually respected through an individual focus and strengths-based approach and shared

responsibility for activities. Thus, the evidence suggests that dialogue during the monthly meetings empowered women. Furthermore, dialogue likely contributed to women's high adherence, given that their mentor and monthly meetings were important factors for their continued participation.

The dialogue that women participated in during the monthly meetings fostered a greater awareness regarding their health. Women participated in a process similar to Freire's empowering education cycle (Sharma, 2017; Wallerstein & Bernstein, 1988), such that women posed problems regarding their health or health plans, clarified the issues and formulated solutions through dialogue with their facilitator. Through this exchange, women became increasingly aware of factors that constrained their health (e.g. expectations of self, societal norms, work demands) and the factors they could influence to affect positive health outcomes (e.g. holistic perspective, self-awareness). For example, women often described feeling "not good enough" or unsuccessful in their achievements during the monthly meetings. Through dialogue, women uncovered the influence of "Tall Poppy Syndrome" (*self-actualisation*) embedded in societal norms, which keeps an egalitarian society in check by discouraging self-promotion. Tall Poppy Syndrome has shown to negatively influence NZ women in a professional realm by targeting them for standing out (Holmes, Marra, & Lazzaro-Salazar, 2017). The present study revealed that women diminished their achievements and strengths across many domains regarding not only their professional sphere, but also their self-image and health behaviours. Through dialogue, women became more aware of how these societal norms influenced the way they evaluated themselves and their accomplishments and subsequently devised solutions to overcome these constraints by placing greater emphasis and recognition on their strengths and achievements. Thus, dialogue enabled women to examine the problems they experienced under a different light and become more aware of the oppressive societal norms that influenced their health. This awareness is comparable to Paulo Freire's concept of empowerment through conscientisation, which theorises that people can gain greater control by realising their contextual constraints (Freire, 1972). Similarly, Paquette and Raine (2004) describe how women play an active role in their interactions with the

disempowering Western sociocultural context and demonstrate different stages of conscientisation; women who are aware of social norms and those who actively empower themselves by resisting societal pressures. Paquette and Raine reiterate that efforts to improve body image “must include transforming the social ties, practices and conventions in everyday relationships” (p.1047), which emphasises the societal need to mobilise dialogue as a tool for social change. Offering a space for women to reflect through dialogue with others is a key way that programmes can empower women over their health in a disempowering context (Strömback et al., 2013). Thus, through dialogue, NLH empowered women over their health by providing a space during the monthly meetings, hone their awareness surrounding their barriers to health and support their purposeful confrontation of oppressive social norms. Future studies could identify ways to create sustainable practice of dialogue beyond interventions in an effort to promote continued empowerment over health. Such critical awareness is essential to empower women over their health given the disempowering context that women reside.

Furthermore, dialogue enabled women to incorporate their individual contexts into the programme, which impacted on their experiences and outcomes. Women interwove their contexts into NLH through devising health plans and reflecting on their progress relative to their personal circumstances, such as making small changes to their existing routines. Through this process, women discovered HPBs that were compatible with their individual contexts demonstrated by their outcomes of *creating routines* and interactional level of *health literacy*, such that women adapted HPBs to shifting circumstances. Despite the crucial role women’s contexts played in NLH, context is rarely considered in health behaviour interventions (Holman, Lynch, & Reeves, 2018). Rather, public health researchers tend to favour RCT designs that emphasise decontextualisation of interventions to determine cause and effect; influence of context is typically deemed a source of intervention failure (Shoveller et al., 2016). Yet, interventions strictly tied to values of fidelity prescribe activities that sacrifice adaptability and may not successfully be transferred to intervention recipients, while overly adaptable interventions lack definition for transference (Shoveller et al., 2016). NLH demonstrates that interweaving intervention activities

with women's unique experiences supported women's continued participation for HPBs and expression of health outcomes. Additionally, personalisation of the intervention goals and monthly discussions greatly contributed to women's satisfaction with, and adherence to, the programme. Public health interventions are social processes that rely on dialogue between researchers and clients in order to create shared meaning towards successful outcomes (Rod et al., 2014; Teuscher et al., 2017): a social process that is inherent to empowerment (Shearer, 2004; Shearer & Reed, 2004). Subsequently, Teuscher et al. (2017) call for health promotion interventions that deliver activities as social interactions that are transferable and adaptable to varying contexts. NLH may offer such a format. NLH is novel among health promotion interventions for moving away from prescribed activities and is rather driven by values with intentional integration of existing context. The current study exemplifies how such a format can support women's health in an ethical and sustainable way. Future research could explore the success of adapting the NLH framework to other contexts by culture, socioeconomic status and geography.

Incorporating dialogue into an intervention however also has its limitations. Face-to-face meetings with 60 women was time intensive for one facilitator and inconvenient for participants at times. Face-to-face meetings could be facilitated via phone or skype, which could reduce burden for both the facilitator and the participants. Further steps to incorporate more in-group components are also feasible to reduce the burden.

***Social support.*** The social media support group offered a supportive environment, which contributed to women's empowerment. Women engaged with the Facebook group throughout NLH and utilised it as a space to share their personal experiences, as well as seek and provide support. Women's consistent engagement with the site through viewing, liking and contributing posts indicated the added benefits for using social media as the group component of NLH. Other programmes report the benefit of creating a collective space with similar others to support women's empowerment through mutual support (Carbonneau et al., 2017; Huberty, Vener, et al., 2008; Mensinger, Calogero, Stranges, et al., 2016; Strömback et al., 2013; Tirlea et al., 2013).

Strömback et al. (2013) reported the importance of providing a space where women can reflect on their experiences among other women as it can be empowering to recognise their shared experiences and barriers. Women's sharing of personal HPB examples and viewing, liking and commenting on other women's achievements suggests a similar pattern of finding confirmation among other women and sharing support. Some of the women verify these findings by noting the group page provided a supportive community. Incorporating the group component of NLH as a Facebook group was advantageous for its convenience; women could access the group at any time of day which did not affect their individual schedules. Compared to women's high adherence to the seven NLH meetings (96.7%), other programmes report lower attendance where the logistics of organising group meetings likely constraint flexibility around meeting times (Carbonneau et al., 2017; Huberty, Vener, et al., 2008; Mensinger, Calogero, Stranges, et al., 2016; Strömback et al., 2013). The convenience of the social media group meant that women could access social support at any time without sacrificing women's adherence to the monthly meetings; the monthly meetings could be flexibly organised based on individual schedules.

However, women's engagement with the Facebook group was primarily passive, with some not utilising the space at all. A recent review reported that while social media used in health interventions can produce low participant engagement this is not necessarily indicative of the benefits gained (Welch, Petkovic, Pardo, Rader, & Tugwell, 2016), meaning that participation as such does not indicate its success. This finding aligns with the fact that the majority of women engaged with the site by viewing each of the posts. However, some of the women recommended the extension of social support by arranging face to face meetings with the group. Since, social support between women is recognised as an important factor for improving health (Small, Taft, & Brown, 2011) and can be advantageous for HPB motivation (Huberty et al., 2009) and collective empowerment (Strömback et al., 2013), in-person interactions may provide added benefit. While the Facebook group provided a shared collective space for some women, adding an in-person group component may further benefit future iterations of NLH. Scheduling group events via the social media page could be a possible solution for creating opportunities for women to meet face-

to-face without sacrificing the convenience of the social media group and flexibility of monthly meetings. The research on social media use for health promotion interventions is still in its infancy and further research on the best use of social media in interaction with real life is warranted.

***Multidisciplinary.*** The multidisciplinary approach of NLH contributed to women's empowerment in several ways. First, promoting health across the six health domains supported women to increase their competency for health across a broad range of health behaviours (*health literacy*). For instance, women reported discovering HPBs related to sleep, self-care and stress management that they had not previously considered before as well as a greater variety of HPBs for "known" health domains such as physical activity and nutrition. Additionally, promoting health across the six health domains empowered women by supporting them to overcome personal barriers. Focusing on six HPB categories enabled women to work through particular domains that they perceived to be difficult at a slower rate without sacrificing their experience of health achievement in other domains. Moreover, if women faced barriers that were difficult to address, such as a physical injury that impeded their ability to achieve physical activity goals, they could still care for their health by achieving goals in other domains. Thus, realising a broader range of health behaviours across the six domains empowered women by expanding their experiences of health-related success and control. According to a review conducted by Schuette et al. (2017), lifestyle programmes tend to focus promotion efforts towards nutrition and physical activity domains. Programmes that promote a narrow scope of domains may not acknowledge the wider potential for an individual to realise their competency for health achievement. Moreover, promoting health with a narrow scope (e.g., only physical activity and nutrition) may not address individual barriers to achieving health behaviours. For example, a person's achievement for physical activity and nutrition behaviours may be impeded by other barriers, such as poor sleep and stress that may go unacknowledged. Promoting health across a wide range of health domains oriented within an ecological health paradigm extends a person's potential for experiencing health achievement and addressing individual barriers within the realm of their volition. Other empowerment programmes for women realise the importance of this interconnectedness and have

promoted health across multiple domains (Carbonneau et al., 2017; Mensinger, Calogero, Stranges, et al., 2016; Tirlea et al., 2013). The most comprehensive programme preceding NLH included domains in social connectedness, body image, self-esteem, self-defence, stress management and physical activity (Tirlea et al., 2013). NLH is the first programme, to our knowledge, that promoted women's health equally across the six domains: physical activity, sleep, nutrition, eating behaviour, self-care and stress management to empower a group of healthy women over their health in a Western sociocultural context.

Another way that the multidisciplinary approach contributed to women's empowerment over their health was the simultaneous promotion of the six domains. The NLH framework placed equal emphasis on each of the domains, which encouraged women to realise the elements of their health as equivalent (e.g., mental health as equally important to physical health) and adopt a holistic view. This approach prompted women to achieve their goals in balance; achievement in one domain could not sacrifice the achievement of another. Thus, risky health behaviours such as compulsive physical activity and disordered eating patterns were confronted when health goals for self-care, stress management and nutrition were simultaneously pursued. Such detrimental behaviours instigate overexertion, unhealthy eating patterns and stress, which thus conflict with other health domains. Additionally, the simultaneous promotion of the six domains supported women to realise the integration between HPBs (e.g., physical activity for stress management and/or self-care), which enabled women to place greater significance on HPBs beyond appearance and body ideals. Not only did this approach support women to combat unhealthy behaviours, but it encouraged women to develop a sustainable approach to their health behaviours. For example, a simultaneous focus on the six domains supported women to focus on a balance between behaviours; adjusting their health behaviours to achievable level when they were stressed and taking time for themselves at a regular frequency. Other programmes support the value of embracing holistic health dimensions at equal value (Carbonneau et al., 2017; Mensinger, Calogero, Stranges, et al., 2016; Tirlea et al., 2013) and foster awareness between multiple dimensions of health, such as connections between physical and mental wellbeing (Ho et al., 2016;

Strömback et al., 2013). However, NLH offers a novel way to support women to develop a holistic health practice through encouraging the simultaneous pursuit between six health domains within their everyday lives. Women's outcomes, in particular their *self-actualisation* and *shift towards a holistic health perspective* provided evidence that the simultaneous promotion of health dimensions that span across institutionally defined disciplinary boundaries empowered women by increasing their health-related competency across a broad range of behaviours with a focus on balance and sustainable change.

However, this simultaneous and multidisciplinary approach meant that women had to keep track of a wide range of behaviours. Some women (n = 4) expressed dissatisfaction in monitoring their goals with the NLH tracking sheets provided. Literature is limited in regard to monitoring simultaneous health behaviour change. Schulz et al. (2011) describe a behavioural intervention that encouraged participants to change five HPBs and simultaneously tracked their behaviours via online questionnaires. However, the study observed a high dropout rate, which the researchers suggest was due to participant burden from completing online questionnaires. Mobile devices offer a promising option for prolonged, real-time behaviour tracking (Mays et al., 2010; Raento, Oulasvirta, & Eagle, 2009; Rathbone & Prescott, 2017). Accordingly, women recommended that goal tracking could be improved by using a digital format, or more specifically, a mobile application (app). An app could offer live HPB achievement tracking (for both participants and researchers), better accommodate the accumulation of goals, and provide live and more frequent feedback regarding women's goal achievement. Thus, interventions that utilise multiple, simultaneous goals may consider designing an app for tracking goal achievement.

***Strengths-based approach.*** NLH utilised a strengths-based approach, which contributed to women's empowerment by supporting women to recognise their assets and health achievements. During the monthly meetings, the facilitator emphasised women's strengths, achievements and progress. Women reported high satisfaction for this approach, particularly noting the importance of a welcoming and encouraging space. More specifically, women felt supported by realising their strengths and small achievements; their barriers were mastered by

drawing on existing assets. A strengths-based approach enabled NLH to emphasise an individuals' strengths and progression as opposed to their deficits and barriers (Whiting et al., 2012). Moreover, adopting a strengths-based approach supported NLH to mitigate harms that are commonly (but unintentionally) caused by behaviour interventions, such as victim blaming and stigma (Carter, Cribb, & Allegrante, 2012). A strengths-based approach was particularly important for supporting women to shift from a failure-oriented mindset to a focus on their small steps forward. Thus, NLH provides initial evidence for the advantages of using a strengths-based approach as a strategy to empower women over their health, and demonstrates an ethical way to promote health at the individual level.

Despite the fact that NLH was progress-oriented and driven by a strengths-based approach, some women reported experiencing feelings of failure. Apart from social norms as previously discussed (i.e. tall poppy syndrome), women's affect likely played a role in their ability to recognise progress; women with positive affect were better able to identify small steps forward, while those with negative affect had more difficulty with this process (McCabe et al., 2001; Roncolato & Huon, 1998). Some women took longer to adopt a strengths-based perspective evident by focus on "strengthening their foundation," or way of approaching HPBs (*creating routines*). However, a benefit to strengths-based approaches is that achievements can be highlighted when such feelings surface. The progress-oriented approach in NLH enabled most women to adopt a more positive, rather than deficit-focused, perspective of health by the end of the programme (*self-actualisation*). This shift in perspective empowered women over their health as they perceived greater control to make positive health changes. Future research might explore women's sustainability of this approach and possibly translate it into other spheres of life, such as a professional realm.

***Weight-neutral approach.*** NLH evaluated women's progress using a holistic and weight-neutral health perspective, which supported women's empowerment over health. During each of the monthly meetings, the facilitator identified women's success across multiple dimensions of health and did not specify change in weight or appearance as an outcome. Evaluating women's

health across a broad range of factors subsequently supported women to broaden their ability to see their achievement beyond appearance or weight. For example, women noted changes in how they were feeling (e.g., energy levels, stress, connectedness with others, strength) and healthy choices across the six health domains as progress. This broadened evaluation of themselves enabled them to experience progress regardless of physical changes, which was encouraging for continued progression. Though weight-loss is highly heterogenous in the population (Swift, Johannsen, Lavie, Earnest, & Church, 2014), it is frequently used as the primary outcome measure in many health interventions (Schuette et al., 2017). A narrow focus to exercise and weight-loss as outcomes not only limits the scope of what women can experience as progress, it also risks their disempowerment by ignoring important parameters for achievement and equating weight to health (Brewis, 2014; Williams, Mesidor, Winters, Dubbert, & Wyatt, 2015). NLH adopted a weight-neutral approach and supported women to realise a greater breadth of health indicators beyond a physical paradigm, which is in line with what other programmes with aims of empowering women over their health have found (Carbonneau et al., 2017; Huberty et al., 2010; Mensinger, Calogero, Stranges, et al., 2016; Strömback et al., 2016). However, this area of research is limited. The shift from disease prevention to a focus on creating wellbeing among modern health promotion necessitates a broader set of parameters to evaluate people's health (Baum, 2015; Baum & Fisher, 2014; Taylor et al., 2014). Findings from the current study provide evidence that healthy women experience health progress in a variety of ways including *creating routines, shifting towards a positive health perspective, health literacy* and *self-actualisation*. Additionally, women demonstrated significant improvements to their psychological empowerment (i.e., health related control and competency), psychological wellbeing (e.g., flourishing), self-perception (i.e., comfort with their bodies), sleep (i.e., day dysfunction due to sleepiness), subjective fitness (i.e., lower perceived exertion after a step test) and achievement for HPBs across the six domains without making significant changes to common evaluation parameters such as, time spent physically active and body composition. Thus, NLH contributes to the current literature by demonstrating the need to assess health as a weight-neutral holistic concept among healthy populations by using an ethical and empowering approach regardless of

weight status (Bacon & Aphramor, 2011; Tylka et al., 2014). Such an approach would be appropriate for evaluating health promotion among populations that experience stigma such as people experiencing mental illness and obesity. Furthermore, findings from the current study provide evidence to overcome the dissonance between public health stakeholders' understanding of wellbeing as holistic concept and reductionist approach of public health interventions (Dooris, Farrier, & Froggett, 2017).

***Assessment across multiple health dimensions.*** While women exhibited a multitude of health improvements, no significant changes were evident regarding their body composition assessments. Given that the sample comprised a healthy group of women, significant changes to body size were not expected. Nevertheless, findings from the current study calls into question the predominant use of body size as an assessment of health status (Bacon & Aphramor, 2011; Tylka et al., 2014). The present study evaluated women's health across multiple health domains, which detected significant improvements to women's health regarding women's psychological empowerment, psychological wellbeing, self-perception, sleep, subjective fitness, reduced symptoms of psychological distress and increased improvement for HPBs across six health domains. Narrowing health assessment to body size would have left these many improvements unnoticed. The health benefits of participating in behaviours, such as physical activity, are beneficial irrespective of change to body size (Swift et al., 2014; Warburton et al., 2006). The current findings call for further research needed to assess health across multiple dimensions and beyond a limited focus on body size to capture a more accurate representation of the benefits people experience, from interventions, but also in the wider context.

***Mixed-methods evaluation.*** A mixed-methods design was key to evaluating NLH and informing future research. A mixed-methods approach provided a comprehensive picture of the outcomes women experienced after participating in NLH. While the quantitative data revealed trends of women's increased control over their health, achievement for HPBs, and improved wellbeing, the qualitative data revealed *how* NLH contributed to these outcomes. Identifying how the programme supported women to become empowered over their health is essential for the

future efficacy of health empowerment interventions. Additionally, the qualitative data illuminated women's self-perceived outcomes. Ultimately, health promotion aims to improve the health and circumstances of those they work with, so it is important to understand what individuals enjoy and experience as success in health promotion efforts. Furthermore, the mixed-methods approach enabled the current study to capture complex outcomes such as changes to women's empowerment, health literacy and holistic wellbeing. This design also offered insight as to how context played a role in the intervention, by illuminating the societal pressures and barriers women were exposed to as well as the women's individual experiences evident by their varied routines and HPBs they developed. Based on a recent review of the evaluation of empowerment programmes, Lindacher et al. (2018) concur that a mixed-methods design is well-suited to evaluate such interventions. They contend that a "gold-standard" method is overall unrealistic, given the flexibility and role of context that empowerment research entails. Despite the core role that concepts like empowerment, holistic health and health literacy play in health promotion, robust assessment of these concepts is required in order to further health promotion progress (Lindacher et al., 2018; Nutbeam, McGill, & Premkumar, 2017). Empowerment and holistic wellbeing are difficult outcomes to assess given their complexity, which make them challenging concepts for generating evidence to apply to health promotion research (Dooris et al., 2017; Lindacher et al., 2018). A mixed-methods evaluation provided diverse insights and comprehensive outcomes, which is a strength of this thesis. Moreover, such concepts are essential to assess in health promotion in the shift from preventing disease to promoting wellbeing. The current study offers a comprehensive account of how women can be empowered using a multidisciplinary intervention within a Western sociocultural context.

# Conclusion

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NZ women's common experience of barriers to good health due to their disempowerment by the dominant Western weight-centred discourse provided strong rationale to conduct this research. The paucity of health programmes designed to empower women over their health under these circumstances further justified the need for this study. Thus, this thesis broadly aimed to design a multidisciplinary programme to empower NZ women over their health. In order to address the overarching aim of the thesis, four research objectives were sought:

1. Develop an intervention to empower women over their health that encompasses physical, mental and social dimensions and is informed by existing research.
2. Implement the programme to a group of healthy New Zealand women and evaluate the impact of the intervention in terms of its outcomes and outcome sustainability for women's health-promoting behaviours, holistic health and participants' perceived outcomes.
3. Evaluate the impact of programme implementation in terms of its reach, fidelity and participant satisfaction.
4. Identify key factors of the programme that empowered women over their holistic health.

Hence, the present investigation transpired by consulting existing research regarding health interventions that aimed to empower women over their health, designing an empowering programme driven by principles of ethics, evidence and theory, implementing the programme to a group of 60 healthy women living in NZ and evaluating its success using a mixed-methods approach. Chapter Nine will briefly summarise the key findings from the present investigation followed by its strengths and limitations to orient its significance for future research.

## Overview of Findings

Overall, the findings from this thesis suggest that a health programme was successfully designed to empower women over their health. This thesis comprises three results chapters, which addressed the four research objectives. Chapter Three addressed the first research objective by reporting on the development and implementation of NLH. NLH was successfully designed and informed by health promotion values, health empowerment theory, and key empowerment strategies identified in the Chapter Two review. These attributes culminated to produce NLH that adopted a participatory and strengths-based philosophy to supporting women to develop HPBs in the context of their everyday lives. The programme was implemented via the NLH framework that guided women to pursue small, achievable goals across six health domains that encapsulated a holistic health paradigm. The six domains included physical activity, sleep, nutrition, eating behaviour, self-care and stress management.

Chapter Five reported on the second research objective, which was concerned with the outcomes that women exhibited and experienced after participating in NLH. Overall, the results indicated that women increased the breadth and balance of HPBs they performed. Women also exhibited positive outcomes for physical and mental health dimensions. Finally, four themes were derived from the participant perceived outcomes, which indicated how NLH empowered women over their health: *creating routines, shifting towards a holistic health perspective, health literacy* and *self-actualisation*. Chapter Six then discussed the outcome results, which collectively suggested that women were empowered over their health by increasing their capacity for HPBs, adopting and experiencing a holistic health approach and enhancing their autonomy regarding their HPBs, health development and ability to generate a sense of success.

Following the outcomes, Chapter Seven reported the results from the process evaluation of NLH. In sum, the majority of women attended the monthly meetings, engaged with the social media support group and progressed through the NLH levels, which signified small goal achievement. The women also reported high satisfaction with the programme particularly

surrounding the monthly meetings with their mentor, the small achievable goals and the adaptability of the NLH framework that supported individualised health goals. Finally, Chapter Eight consulted the final research objectives (three and four) to determine the success of programme implementation and uncover the key attributes of NLH that contributed to women's empowerment. Upon integrating the findings from women's outcomes and the NLH process evaluation, eight key attributes were identified from NLH that contributed to women's empowerment over health or were vital for evaluating their success: (1) an emphasis on sustainable change utilising a *small goals approach*; (2) *dialogue* that enabled women to participate in health planning monthly meetings; (3) *social support*; (4) a *multidisciplinary approach* that supported a holistic health practice; (5) a *strengths-based approach*; (6) a *weight-neutral approach* to evaluate women's success; (7) *assessment of multiple dimensions*; and a (8) *mixed-methods* design for evaluation.

This research is founded upon the premises (established in Chapters One and Two) that women living in NZ experience poor health and related behaviours. The Western sociocultural context that comprises popular media and neoliberal health discourse contributes to women's poor health through disempowerment by promoting health as a corporeal concept that is equitable to appearance. The findings from this investigation suggest that women can become empowered over their health by realising and adopting a holistic health approach by making small changes across multiple health domains within their individual context. Through their active involvement during the programme under facilitated and independent circumstances, women were supported to gain competency over their health by realising their strengths within a holistic paradigm and overcome personal barriers within a disempowering context. NLH supported women to not only exhibit positive health outcomes, but *experience* them through iterative application and reflection of their own lived experiences of health. Women's reported outcomes suggest that women transitioned intrinsically in the way they perceived, embodied and practiced their health. Their continued achievement for outcomes six months after participating in NLH, is encouraging for the sustainability of their improvements and purposeful autonomy amidst contemporary society.

## **Strengths of this Research**

Findings from the current study make significant contributions to health promotion research, in particular, by providing evidence on how to promote and evaluate empowerment and holistic health among women. The findings are further strengthened by reporting data on 60 women integrating both quantitative and qualitative insights, capturing outcomes across physical, mental and social health domains, and reporting on both the investigator's objectives as well as what the women experienced as outcomes themselves. Utilising both the quantitative and qualitative data provided a comprehensive picture of women adopting a health practice that focused on balance within individual contexts. Furthermore, the evaluation of NLH identified women's shift from appearance-driven behaviours to HPBs driven intrinsically, providing good evidence on how to achieve sustainable outcomes in health interventions. This project shows the advantage of assessing a wide variety of health indicators beyond a narrow definition of health. The process evaluation findings add further strength to this study, which can serve to inform future intervention research, particularly those that seek to utilise approaches related to holistic health and empowerment. Thus, the results are relevant to many in disciplines including intervention research, health promotion and women's health.

This research also offers a programme that not only promotes health holistically, but also holds potential for its adaptability to a range of contexts and populations. As demonstrated by the current study, the framework allowed for contextualisation, yet remained highly reproducible indicated by the 58 NZ women who completed the six-month programme. Overall, the programme required very low resourcing and potentially provides a practical design for individual health promotion in a variety of contexts.

## **Limitations of this Research**

The limitations of this study must be considered to fully interpret its findings. First, researchers must carefully consider the context and sample when interpreting the results. NLH

was designed for women aged 18-40 years living within a Western sociocultural context, specifically, NZ. Furthermore, the sample was predominantly European and resided in an urban setting and thus not representative of all NZ women. While Western body ideals have been detected widely among women, the predominant internalisation of these values has been shown to differ between women by ethnicity and age (Talwar et al., 2012; Tiggemann, 2004). The women were self-motivated to participate in NLH and develop their health evident by the ease of recruitment and the women's collective desire to improve their health at baseline. This self-motivation likely aided women's adherence to NLH and participation in the goals. Additionally, the NZ context disseminates Western ideals, which makes a holistic perspective of health empowering by confronting normative body ideals. Such empowerment may not be relevant for other contexts. However, Western ideals that value an ideal body and foster adipophobic attitudes against obesity are increasing globally (Brewis, Wutich, Falletta-Cowden, & Rodriguez-Soto, 2011; Swami et al., 2010). The globalisation of Western ideals and their accompanying disempowerment may entail the increasing relevance of NLH.

The absence of a control group in the study design may also be considered a limitation of this investigation. Without a control group, the interpretation of the cause of the observed outcomes from this study are limited by design. However, given the extensive role of context and women's participation in the programme activities as well as the holistic and multidisciplinary nature of NLH, it is arguable that an added control group would provide very little contribution in determining the cause and effect of results. Since NLH tailors to individual preference, strengths, barriers, and context, creating a matched control group would prove an incredibly difficult task. A waitlist period prior to participating in NLH may be a plausible option as a control for future iterations of NLH. Nevertheless, the intervention ultimately aimed to empower women to be healthy in the face of future adversity thus requiring a very long and extensive study design, which was impractical for this thesis.

As this was a pilot study, new measures were implemented to evaluate women's outcomes. The NLHQ was specifically designed to assess HPBs that were compatible with NLH.

However, due to the constraints of completing a timely dissertation, the NLHQ has yet to be assessed for its validity and repeatability. This limitation, however, reinforces the advantage of collecting qualitative data, which provide a layer of validity for the quantitative data in a convergent mixed-methods design (Cresswell & Plano Clark, 2018). Validation of the NLHQ would strengthen the findings from this study. Other researchers report the challenge of assessing empowerment and often employ self-designed instruments to evaluate outcomes (Lindacher et al., 2018).

A further limitation was that the majority of the data were collected via surveys, which introduced the possibility of self-reported bias. Women have been identified to under-report information such as energy intake (Gemming, Jiang, Swinburn, Utter, & Mhurchu, 2013), smoking (Ford, Tappin, Schluter, & Wild, 1997) and severity of poor mental health symptoms (Hunt, Auriemma, & Cashaw, 2003). Thus, the potential for self-reported bias must be taken into account when interpreting these results. Furthermore, the 31 HPBs that assessed women's behavioural outcomes only provided a snapshot of the HPBs that women achieved at each time point. For instance, in the qualitative data, women reported decreasing their alcohol intake and becoming more mindful of the foods they ate, which were not HPBs that were captured by the quantitative HPB assessments. However, the assessment of women's HPBs was ultimately constrained by accounting for participant burden by surveys. Again, a mixed-methods approach was advantageous to capture HPB outcomes more broadly and interpret what the observed changes meant. In light of multidisciplinary HPB evaluation, this research area is in its infancy and NLH contributes with its assessment of 31 HPBs across six health domains.

The present design of NLH assumes a person's pre-existing desire for improvement based on the underpinning concept of health empowerment theory (Shearer, 2009; Shearer & Reed, 2004). NLH demonstrates its ability to enhance a person's volitional control. However, structural adaptations to facilitate individual choice are needed for many populations, for instance lower socioeconomic groups are restricted by resources (e.g., monetary, occupational, geographic), while indigenous groups are restricted by access to traditionally relevant resources, such as health

care, health facilities and other opportunities (Auger et al., 2016). NLH is thus designed to work alongside health promotion at the community and societal level and not a panacea.

## **Future Research**

Based on women's recommendations for improvement, NLH may benefit from enabling further personalisation of the small goals to enhance individual relevance. Future iterations could provide a miscellaneous option for women to define their own small goals beyond the pre-defined selection of the NLH framework. Additionally, women could have the option to progress through level topics in their desired order and perhaps create a miscellaneous level topic. Such alterations would extend women's freedom to define goals and pursue topics they find most relevant to them, yet still provide guidance and structure for NLH reproducibility. Furthermore, women recommended increasing the tangibility of the small goals within the self-care and stress management domains to better gauge their achievement. For instance, a small goal for self-care might be to write a weekly list of at least three personal achievements. Upon reflection, incorporating a stronger representation of the social health dimension embedded in the NLH framework could further strengthen its empowering potential. Such modifications could be achieved by incorporating a distinctive domain dedicated to social health or more explicitly embedding social health into compatible NLH levels. A level could be designed to address one's social health, such as meeting with a friend or participating in a social activity. Additionally, the six domains may be modified to fewer domains that encompass the six areas. For instance, NLH could focus on four domains: physical activity, sleep, healthy eating (encompassing eating behaviour and nutrition) and mental wellbeing (that encompasses self-care and stress management). Accordingly, the healthy eating domain would concentrate on elements of both intake and applied skills to support healthy eating. Mental wellbeing would address both the promotion of positive wellbeing as well as strategies to manage negative psychological distress. Promoting health across four domains may reduce burden on the participants without sacrificing the content of NLH or benefits of a simultaneous approach.

Given that a Western sociocultural context prevalently disempowers women across the globe, the positive outcomes observed from this research warrant further investigation of NLH to similar samples.

While the current study aimed to empower women at the individual level, NLH could be adapted to promote health at an organisational or community level given the collective conceptualisation of empowerment (Laverack, 2016). Women in particular would benefit from a collective adaptation of NLH, since social support is a pillar to women's health (Small et al., 2011). The levels could be pursued as a group, such that small goals are tailored to individual preferences and lifestyles. The group could actively participate to assist each other in facilitated dialogue to plan, pursue and reflect on their health goals. This modification would enable women to collectively, as opposed to individually, address shared barriers such as gendered norms and body ideals. Confirmation by familiar others has shown to be empowering for women in other interventions (Duberg et al., 2016; Strömback et al., 2013; Ussher et al., 2016). The small goals could prompt conscientisation of contextual constraints shared by the group. Thus, future iterations of NLH adapted to a community level could involve more critical reflection to increase awareness of women's constraints to prompt advocacy efforts for change at a systems level. NLH adapted to a community level thus seems a plausible option for critical health promotion. Similar modifications may be advantageous for a myriad of groups that experience inequity, such as those of a lower socioeconomic status and indigenous groups as they often face disempowerment at a structural level.

At its core, NLH offers a design to empower people over their health within their existing constraints and has potential for other contexts. The programme's embodiment of a holistic paradigm may offer compatibility, if appropriately adapted, to groups that embrace a holistic view of health, such as indigenous populations. Future iterations of NLH could be applied to promote wellbeing in clinical settings. The multidisciplinary and holistic approach may prove advantageous to empower people who experience barriers due long-term health conditions or in rehabilitation. Furthermore, routines are identified as a way to manage health and adapt to the

disruptions of chronic illness (Crespo et al., 2013), which may be complementary to integrating HPBs as well as self-management strategies. NLH could also be very relevant to promote health among nursing populations. Research indicates that despite nurses' knowledge of HPBs across the six domains, nurses experience barriers to HPBs due to the demands and environment of their work, for instance, long hours, shift work, workload and unhealthy social eating practices (Nicholls, Perry, Duffield, Gallagher, & Pierce, 2017; Ross, Bevans, Brooks, Gibbons, & Wallen, 2017). Promoting a holistic perspective could be beneficial given that nurses are subject to poor mental and physical health (Ross et al., 2017), not to mention a setting that is dominated by the biomedical model of health. Furthermore, (Torquati, Kolbe-Alexander, Pavey, Persson, & Leveritt, 2016) report that improving relaxation, energy before work and better sleep facilitate nurses' participation in physical activity. A programme like NLH that promotes small HPB changes into existing lifestyles and integrates multiple health domains could prove beneficial to empower this target group over their health. Additionally, NLH would be compatible for promoting nurses' health through goal setting, self-monitoring and a social support from colleagues as recommended by Torquati et al. (2016). NLH could be trialled as a workplace health promotion programme implementing a group component to build collective empowerment towards improving nurses' holistic wellbeing.

Future iterations of NLH could also be applied in settings-based health promotion, such as schools. NZ students tend to report contemporary conceptualisations of health, such that one's health is the product of individual action (Burrows & Wright, 2004) and a corporeal concept (Burrows, 2008). Such views are concerning given that they reflect the dominant discourse of WCHP that is over simplistic and contribute to harms such as victim blaming, stigma and poor health outcomes (O'Hara & Taylor, 2018). Little change to this poor patterning of health is possible if future generations continue to adopt detrimental assumptions at an early age. Furthermore, lesser addressed factors, such as sleep are important to consider for this age group (Muller, Signal, Elder, & Gander, 2017). Thus, NLH offers a potential solution to promoting a holistic perspective of health within a school setting and prompt critical awareness of

disempowering social norms. Such an approach would align with shifts in physical education policy that are embracing a more holistic perspective (Burrows & Wright, 2004). Furthermore, Fitzpatrick and Tinning (2014) call for a more democratic and empowering approach to health education in schools that incorporates the consideration of students' contexts and transitions away from the predominant traditional approach of education that shapes young minds towards healthism. Empowerment programmes have been successfully implemented among groups of young people to improve self-esteem (Tirlea et al., 2013). NLH holds potential to prompt holistic and critical thinking of health at an earlier age to counteract the dominant and harmful socially constructed values such as body image, healthism and adipophobia.

Finally, future evaluation could include comprehensive assessments of particular domains to provide a more complete picture of NLH findings. For instance, food diaries could provide a more comprehensive picture of change to women's dietary intake and research-grade activity trackers (e.g. ActiGraph activity monitors) could provide objective assessment of women's physical activity and sleep. Additionally, incorporation of strength and flexibility testing could provide increased variety of objective physical health assessment. Since NLH adopted a non-diet approach to healthy eating, future evaluation of NLH may benefit from incorporating assessment with an intuitive eating scale (Tylka, 2006). In-depth assessment of social health could evaluate outcomes for social domains such as social integration, social acceptance, social contribution, social actualisation and social coherence (Keyes, 1998), which may provide a more complete picture of outcomes following NLH for social health. As proposed previously, an app via a mobile device could be advantageous for tracking women's HPBs in real-time and create opportunity to provide the participants with instant feedback, which is positive for HPB development (Parekh, Vandelanotte, King, & Boyle, 2012). Given the holistic nature of the programme, NLH holds the potential to be applied and evaluated in a myriad of ways. However, caution must be taken to avoid overburdening participants.

## Implications for Health Promotion Practice

It is evident that women living in NZ experience poor health and are disempowered by societal values of an ideal body. The dominant health paradigm further disempowers women by conflating body size and health. The present study demonstrates that women can be empowered over their health by realising and experiencing their health holistically within a weight-neutral paradigm. Health advocates call for health promotion efforts to transition from a focus on disease prevention to an emphasis on building good health (The Mental Health Commissioner, 2018). The current study answers this call with the creation of a health programme underpinned by empowerment, health promotion values and evidence-based. NLH exemplifies a way forward for future intervention research promoted at the individual level. Moreover, this investigation provides evidence on how health promotion as a discipline can embrace its values alongside reaching its goals. These findings are encouraging and further support a shift towards people-centred health promotion (Carter et al., 2011; Raeburn & Rootman, 1998).

Empowerment is a core component of modern health promotion, but its conceptualisation is elusive thus limiting its effective promotion and evaluation. The present study offers eight key attributes of interventions that contribute to and evaluate women's empowerment over health: (1) *small goals approach*; (2) *dialogue*; (3) *social support*; (4) *a multidisciplinary approach*; (5) *a strengths-based approach*; (6) *a weight-neutral approach*; (7) *assessment across multiple dimensions*; and (8) *a mixed-methods design* for evaluation.

Lifestyle interventions tend to promote health by narrowly target physical activity and nutrition and evaluate outcomes as changes to exercise and weight (Schuette et al., 2017). NLH exemplifies how health can be promoted using a broader approach by including health domains such as sleep, self-care and stress management in combination with eating behaviour, nutrition and physical activity domains within a holistic and weight-neutral paradigm. This approach to promoting and evaluating health is superior to interventions targeting weight or body size as outcomes based on ideological, empirical and technical grounds (O'Hara & Taylor, 2014).

Furthermore, holistic evaluation of women's health enabled identification of significant improvements across a wide range of parameters including psychological empowerment, psychological wellbeing, self-perception, sleep, subjective fitness, reduced symptoms of psychological distress and increased improvement for HPBs across six health domains without observing significant changes to common evaluation parameters such as total time spent physically active and body composition. Thus, it is recommended that health is assessed across multiple dimensions placing equal value on dimensions such as mental wellbeing.

Finally, the findings from the current study indicated that healthy women experience empowerment over their health by *creating routines, shifting towards a holistic health perspective, health literacy* and *self-actualisation*. Women's perceived outcomes revealed that identifying health benefits across a wide range of factors was empowering and encouraging for continued participation in their health behaviours. Thus, women's experience of success should be considered when supporting their health development.

This thesis ends with a few words from the women participating in NLH...

*What is the most valuable thing you will take away from participating in the programme?*

“Self-love and self-care. It all starts there. If you value yourself, you will treat your body well, as the effects flow on to all other aspects of life” (P15).

“Believing in myself to achieve anything I set my mind to. ‘Big or small’” (P1).

“The tools that allow me to make the changes necessary to improve my health and well-being” (P9).

“Mental health strategies and recognising my signs to take care of ‘me’” (P10).

“That I am important. It is important to look after my mental well-being just as much as physical well-being” (P13).

“My body is my home and it deserves to be valued and taken care of, because it enables me to do all the things I love and which make me happy” (P25).

“The ability to keep taking small steps and making gradual changes in order to succeed in my health goals rather than just giving up” (P28).

“A greater sense of awareness about my habits and behaviour, which gives me a greater ability to make positive changes” (P29).

“A holistic approach to health and not what is usually pushed by our society as the right approach (e.g. losing weight as the main goal)” (P37).

“The idea that change is within my control and it doesn’t always need to be drastic to make a difference” (P48).



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# **Appendix A: Detailed Search Strategy, Inclusion & Exclusion Criteria for the Review**

## **Aims**

This review sought to (1) identify programmes that aimed to empower women with a focus on wellness in a Western sociocultural context; (2) determine effective strategies utilised to empower women by such programmes; and (3) discover how researchers assessed women's success in the programmes.

## **Methods**

The PRISMA statement (Moher, Liberati, Tetzlaff, Altman, & Group, 2009) guided the protocol and reporting of this review utilising the associated checklist and flow diagram.

## **Interventions**

### *Inclusion criteria*

Only studies that were programmes were included in the review Programmes included in this review focussed on those that:

- Involved a health programme or intervention
- Stated empowerment in the programme aims, underpinning theory, programme description, OR adopted a Health at Every Size (HAES) approach given the alignment with empowerment values in the HAES philosophy and relevance to Western sociocultural ideals (ASDAH, 2017).
- Promoted women's health and wellness.
- Recognised the limitations of Western sociocultural influence on body image.

### *Exclusion criteria*

- Was not a health programme or intervention.
- Did not state empowerment or HAES in the programme approach.

- Specified efforts towards disease improvement or prevention rather than promotion of health and wellness.
- Were not based in a Western society where value of the thin ideal is prevalent.
- Focused on weight-loss, maintenance or weight gain prevention, given the focus of the review geared towards empowerment rather than disempowerment by body ideals.

## **Participants**

### *Inclusion*

- Only programmes directed at healthy females were considered.

### *Exclusion*

- Targeted women with a clinical condition (e.g. diabetes, cancer, depression, psychosis, disordered eating) were not considered for this review. Women classified as overweight or obese were not considered experiencing a clinical illness.
- Programmes that targeted specific populations such as women who were pregnant, breastfeeding, menopausal, victim to violence, immigrant or of a particular sexual orientation were also excluded due to specialised program content.

## **Study designs**

### *Inclusion*

- Original research articles that reported findings from the intervention were included.
- Quantitative, qualitative and mixed-methods designs were included.
- Non-controlled studies were included.

Relevant study protocols were explored for related programme output published elsewhere. Likewise, articles reporting outcomes that referenced a more detailed description of the program elsewhere were explored to inform the review. Pertinent reviews were also sourced for eligible studies

#### *Excluded*

- Studies that did not report on original research
- Case studies were excluded due to limited scope of interpretation.

#### **Search strategy**

A search was conducted in PubMed, Web of Science, Scopus and Discover databases. Discover is a search engine that explores article databases with university library access such as PsycINFO, CINAHL Complete, Academic Search Premier, MEDLINE, ScienceDirect as well as other library materials. Only articles published in peer-reviewed journals were considered. Key terms included in the search were variations of: women, body image, self-acceptance, self-worth, empowerment, “health at every size”, programme, intervention, campaign and trial. More specifically, the search was conducted as follows: TITLE-ABS-KEY ((“girl\*” OR "women" OR "woman" OR "female\*") AND ("empower\*" OR “health at every size”) AND ("body image" OR "self-acceptance" OR “self-worth” OR “self-esteem”) AND ("intervention\*" OR "program\*" OR "campaign\*" OR "trial\*")). The search was limited to English articles published in scholarly peer-reviewed journals between 2005 and 2018. If full text was not available, the study was not considered. Search results from all databases were exported to Endnote (version X7, Thomson Reuters).

#### **Study Selection**

Duplicate removal was achieved using Endnote. Titles and abstracts were screened for eligible study criteria. If eligibility was unclear, the article was included in the second selection phase. For second selection phase, the full text article was scanned for participant characteristics, reference to empowerment, programme setting and relevance to promotion of a positive body

image and general wellbeing. Articles stating a “Health at Every Size” approach were also considered given their philosophy in alignment with empowerment. Reference lists from included studies were sourced as per inclusion criteria. Two researchers, V.C. and supervising investigator, M.T., independently followed the search strategy and study selection protocol to identify eligible articles to reduce selection bias. V.C. and M.T. conferred over any discrepancies for articles as per inclusion and exclusion criteria.

### **Data Extraction and Synthesis**

Data were extracted detailing author(s), publication year, participant characteristics, intervention characteristics, aims and empowerment strategy into excel spreadsheet to provide programme description. Then, articles were coded for programme delivery strategies and outcome assessments. Outcome measures were explored for significant findings at post-intervention and follow up if applicable. After data were compiled, programme strategies and outcome evaluations were explored for themes across the programmes. Furthermore, study findings detailing evaluation of programme delivery strategies (process evaluation) were explored to inform success of the strategies employed during the programme in terms of empowering women to achieve and sustain health outcomes.

Multiple studies reported on a single programme. For example, one study reported outcomes from the programme at post-intervention and then another study was later published on findings at follow up. Additionally, a couple of the programmes were delivered more than once under different study designs (e.g. initially conducted as a feasibility study and then conducted later as a controlled trial). Hence, the terms “programme” and “intervention” were used to describe the overall programme, while the terms “trial” and “study” specified the independent trials. Accordingly, data were extracted from each unique study to inform the review. Data detailing programme outcomes and unique study designs were retained as individual outputs, while data describing programme delivery strategies and aims were summarised to describe the overall programme.

## **Appendix B: Detailed Summary of Programme Delivery Strategies**

A summary of delivery for each of the programmes is provided in Table A1. All five programmes were delivered by facilitators in a group format. Facilitators were either health professionals across a range of disciplines (e.g. registered dietician, social worker, psychologist, physiotherapist, community health nurse) or trained to deliver programme. Interventions involved groups of women between 10 (or fewer) up to 30 participants.

Programmes varied widely by their delivery and behaviour change strategies. For instance, some of the programmes followed a set curriculum (Carbonneau et al., 2017; Mensinger, Calogero, Stranges, & Tylka, 2016; Provencher et al., 2007) while other programmes combined topics that were pre-defined and participant-determined (Strömbäck, Malmgren-Olsson, & Wiklund, 2013; Tirlea, Truby, & Haines, 2013). The content from one of the interventions was delivered by books related to the programme's aims (Huberty et al., 2008). All of the programmes employed group discussion to explore learning materials and participant's experiences. Several of the programmes also delivered a range of practical activities including body awareness and relaxation strategies (Strömbäck et al., 2013) and group physical activities (Huberty et al., 2008; Tirlea et al., 2013). Programmes that promoted healthy lifestyle changes employed strategies such as goal-setting, self-monitoring, devising long-term health plans, and building internal bodily and mental awareness.

Likewise, the learning topics that programmes delivered to improve women's wellness tended to be diverse. One programme emphasised creating bodily awareness and techniques related to stressors and their management, while three of the programmes promoted multiple healthy lifestyle behaviour changes. However, they contained some similarities. For example, most of the programmes concentrated on a variation of women's self-acceptance including self-acceptance (Carbonneau et al., 2017; Provencher et al., 2007), self-worth (Huberty et al., 2010; Huberty et al., 2008), self-esteem (Tirlea et al., 2013) or, specifically, size acceptance (Mensinger

et al., 2016). One of the programmes focused on women's stressors and related factors (e.g. sleep, gendered pressures). Four of the five interventions encouraged women to make healthy lifestyle changes. Most of the programmes also focused on improving women's physical activity, particularly encouraging participation for purposes of enjoyment (Carbonneau et al., 2017; Huberty et al., 2010; Huberty et al., 2008; Mensinger et al., 2016; Provencher et al., 2007; Tirlea et al., 2013). Several of the programmes included topics on women's eating behaviours and patterns; two of which focused on eating for wellness. A couple of the programmes explicitly included topics on women's interpersonal relationships such as social support (Huberty et al., 2010; Huberty et al., 2008; Mensinger et al., 2016; Tirlea et al., 2013) and connectedness (Strömbäck et al., 2013).

Table A1

*Summary of Empowerment Delivery Strategies and Content*

Programme Name	Investigation(s)	Facilitator(s)	Delivery format	Delivery Strategies	Behavioural strategies	Learning Topics
Choisir de maigrir?	Carbonneau et al., 2017 and Provencher et al., 2007 <sup>a</sup>	Registered dietitian and a social worker or psychologist	Group (n=10-15)	<ul style="list-style-type: none"> <li>lectures</li> <li>guided self-reflection and observations</li> <li>group discussions</li> <li>practical exercises</li> </ul>	<ul style="list-style-type: none"> <li>self-monitoring by weekly food diary</li> <li>focus on internal physiological signals for eating</li> <li>self-defined action plan for long-term behavioural and wellbeing outcomes</li> </ul>	<ul style="list-style-type: none"> <li>eating behaviour</li> <li>physical activity for enjoyment, nutrition</li> <li>realistic weight loss objectives</li> <li>behavioural influences of others</li> <li>body acceptance</li> </ul>
HUGS	Mensingher et al., 2016	Psychotherapist and fitness professional	Group (n=20)	<ul style="list-style-type: none"> <li>set curriculum</li> <li>books</li> <li>workbook</li> <li>affirmation CDs</li> <li>sharing positive affirmations and changing routines with the group</li> </ul>	<ul style="list-style-type: none"> <li>healthy lifestyle choices by gradual sustainable change</li> <li>focus on internal physiological signals for eating behaviour</li> <li>social support network after programme</li> </ul>	<ul style="list-style-type: none"> <li>curriculum related to HAES principles</li> <li>nutrition for health and wellbeing</li> <li>size acceptance</li> <li>physical activity for enjoyment</li> </ul>
Girls on the Go! (Study 1)	Tirlea et al., 2013 <sup>b</sup>	Health professionals (social worker, recreational worker and community health nurse) or others trained as facilitators	Group (n=20-30)	<ul style="list-style-type: none"> <li>group discussion</li> <li>community-based activities</li> <li>team-building</li> <li>reflection on learnings and achievements</li> <li>dissemination of learnings to community</li> <li>practical activities: taekwondo, yoga, rock climbing, group-defined activity</li> <li>Special note: programme may be modified to particular group based on skills and experiences</li> </ul>	<ul style="list-style-type: none"> <li>realistic goal setting for exercise</li> <li>practical activity planning and implementation</li> </ul>	<ul style="list-style-type: none"> <li>body image (and related issues)</li> <li>self-esteem</li> <li>personal safety and assertiveness, mental health (management of stress and adverse thoughts)</li> <li>trust</li> <li>social support/connections.</li> <li>discussion on how stay healthy in the community after the programme.</li> </ul>

(cont.) Programme Name	Investigation(s)	Facilitator(s)	Delivery format	Delivery Strategies	Behavioural strategies	Learning Topics
<b>Stress management course</b>	Stromback et al., 2013 & 2016	Physiotherapist	Group (n= "up to 10")	<ul style="list-style-type: none"> <li>• problem-based learning</li> <li>• reflective group discussions</li> <li>• personal reflection (mental and written)</li> <li>• short lectures to prompt discussion</li> <li>• practical exercises: basic body awareness therapy and progressive muscle relaxation</li> </ul>		<ul style="list-style-type: none"> <li>• bodily and emotional awareness</li> <li>• topics defined by women in preliminary interviews</li> <li>• stressors and responses (e.g. "How do I react to stress?", "What is stress for me?", "How do I cope with stress?",</li> <li>• stress physiology</li> <li>• sleep</li> <li>• recovery</li> <li>• loneliness</li> <li>• coping</li> <li>• gendered issues (e.g. expectations of body ideals, expectations for girls to assume responsibility in social relationships, pressures of perfection, high achievement (e.g. What is it like to be a contemporary young woman?", How can I set limits?")</li> </ul>
<b>Women Bound to be Active</b>	Huberty et al., 2010	Students in physical activity and health promotion trained as facilitators	Group (n=20)	<ul style="list-style-type: none"> <li>• book club style</li> <li>• books</li> <li>• syllabus</li> <li>• workbooks</li> <li>• homework</li> <li>• group discussion of books</li> <li>• reflection on experiences regarding PA successes and challenges</li> <li>• practical activities: walking, low impact aerobics and home-based circuit training</li> <li>• building social support</li> </ul>	<ul style="list-style-type: none"> <li>• non-regimented PA</li> <li>• self-defined goal-setting supported by skills and knowledge from the programme</li> <li>• plan for overcoming barriers</li> <li>• self-monitoring</li> <li>• tapering intervention meetings to foster independence</li> </ul>	<ul style="list-style-type: none"> <li>• physical activity: getting started, benefits (enjoyment, holistic, social) and barriers,</li> <li>• improving adherence,</li> <li>• goal setting/relapse prevention</li> <li>• access to social support</li> <li>• introduction to pedometers</li> <li>• cardiovascular fitness, strength training</li> <li>• adapting exercise to suit personal needs</li> <li>• routine PA in daily life</li> <li>• self-worth</li> <li>• exploring self-belief</li> </ul>

## **Appendix C: Summary of Programme Evaluation**

Programme outcomes were predominantly assessed by quantitative parameters, however two of the programmes were evaluated using qualitative data (Huberty, Ehlers, Coleman, Gao, & Elavsky, 2013; Huberty et al., 2009; Strömback, Malmgren-Olsson, & Wiklund, 2013). Two of the investigation adopted a mixed method approach (Huberty et al., 2013; Huberty et al., 2009). Additionally, one of the studies employed a mixed method discussion by building quantitative data on top of previously published qualitative findings that originated from the same trial (Strömback, Wiklund, Salander Renberg, & Malmgren-Olsson, 2016).

All five of the programmes were evaluated under a psychosocial domain. Studies evaluated women's psychological wellbeing (n = 9), self-perception (n = 5) and psychological distress (n = 4). Instruments to assess women's psychosocial parameters varied widely. Four of the empowerment programmes evaluated women's outcomes under a behavioural domain. Specifically, researchers assessed women's eating behaviour and patterns (n = 3), physical activity (n = 3), dietary quality or intake (n = 2), appetite ratings (n = 1) and behavioural determinants (n = 2). Three of the programmes evaluated women's wellness under a physical domain. Researchers assessed women's physical health outcomes using anthropometric measures (n = 3) and metabolic parameters (n = 2). Women's BMI was the most commonly assessed physical measure, however other assessments included weight, waist circumference, hip circumference and waist-to-hip ratio.

A summary of the outcomes for each of the 16 articles is provided in Table 2A. A detailed summary of the measures employed and resulting outcomes is provided in Table 3A.

Table 2A

*Summary of Empowerment Programme Outcomes*

Investigation	Programme Title	Data Type	Outcomes			
			Psychosocial	Physical	Behavioural	Qualitative Themes
<b>Begin et al., 2018</b>	Choisir de maigrir?	Quantitative	Psychological distress**, psychological wellbeing**, self-perception**	Anthropometric profile	Eating behaviour**	N/A
<b>Carbonneau et al., 2017</b>		Quantitative	N/A	N/A	Eating behaviour**, diet quality*	N/A
<b>Leblanc et al., 2012</b>		Quantitative	N/A	Anthropometric profile	Eating behaviour, eating patterns, dietary intake, physical activity	N/A
<b>Gagnon-Girouard et al., 2010</b>		Quantitative	Self-perception**, psychological distress**, psychological wellbeing**	Anthropometric profile**	Eating behaviour**	N/A
<b>Provencher et al., 2009</b>		Quantitative	N/A	Anthropometric profile, metabolic	Eating behaviour**, appetite ratings*, physical activity	N/A

<b>Provencher et al 2007</b>		Quantitative	N/A	N/A	Eating behaviour*, appetite ratings*	N/A
<b>Mensingher and Meadows, 2017</b>	HUGS	Quantitative	Self-perception*	N/A	Physical activity*	N/A
<b>Mensingher, Calogero &amp; Tylka, 2016</b>		Quantitative	Self-perception**	N/A	Eating behaviour**	N/A
<b>Mensingher, Calogero, Stranges &amp; Tylka, 2016</b>		Quantitative	Psychological wellbeing**, psychological distress	Metabolic parameters**, anthropometric profile**	Physical activity**, dietary intake**, eating behaviour**	N/A
<b>Tirlea et al. 2013 and 2016*</b>	Girls on the Go! (Study 1)	Quantitative	Psychological wellbeing*	N/A	Behavioural determinants*, eating behaviour*	N/A
	Girls on the Go! (Study 2)	Quantitative	Psychological wellbeing*†	N/A	Behavioural determinants*, eating behaviour§	N/A
<b>Stromback et al., 2016</b>	Stress management course	Mixed (Quantitative building on qualitative from previous study)	Self-perception*, psychological distress*	N/A	N/A	<b>Discussion points from mixed results:</b> Contextualising by listening to young women's voices; encouraging embodied freedom and agency

<b>Stromback et al., 2013</b>	Qualitative	N/A	N/A	N/A	<p><b>Themes:</b> A space for gendered and embodied empowerment in a hectic life; finding a social oasis to challenge gendered expectations [being confirmed in a non-judging and supportive atmosphere; making space for reflections on gender and stress], being bodily empowered [approaching the problematic body, finding breathing space], altering gendered positions and stance to life [upgrading oneself and one's abilities; switching pace in life; setting limits and resisting outer pressure]. <b>Discussion points:</b> the need/use of social support and gendered collective understanding; the need/use of safe explorative spaces; the need use of (collective) change and action; the need/use of gender-sensitive youth friendliness</p>
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<b>Huberty et al, 2013</b>	Women Bound to be Active	Mixed Methods	Psychological wellbeing	Anthropometric profile**	Behavioural determinants**, physical activity	<p><b>Overall changes in PA:</b> women who completed WBA reported higher motivation for PA and more consistent PA, less active than right after the programme but still improved from baseline; <b>Benefits of PA:</b> completers reported benefits included health, wanting to feel good, stress relief and weight management discussed in terms of self-worth and quality of life. Non-completers emphasised weight-management and health. <b>Breaking barriers to PA:</b> completers reported time as the primary barrier. Other reported barriers were physical injuries and ailments. They reported overcoming barriers by seeking new activities as motivation, being active with children. Non-completers described lack of time and motivation as barriers as well as competing commitments "difficulty sticking with it." They also tended to report passive strategies to overcome barriers (e.g. mental preparation). <b>Self-worth:</b> reported changes in the way they felt about themselves and PA, renewed interest in themselves and dedicated time and energy to meeting their needs, also increased confidence. Non-completers reported less self-investment. <b>Perceptions of PA and self-worth:</b> New perceptions shifting value to participation in PA rather than primarily weight, broadened perspective. Non-completers did not report change in perception. <b>Social support:</b> Social support from family (husbands, children), friends, coworkers and social groups supported them to be physically active. Some reported that they were motivated on their own. Social support in the programme was also helpful finding common ground with others, shared experiences. More likely to reach out for support or seek accountability.</p>
<b>Huberty et al, 2010</b>	Women Bound to be Active	Quantitative	Psychological wellbeing*	Anthropometric profile	Behavioural determinants*, physical activity*	N/A

<b>Huberty et al., 2009</b>	Women Bound to be Active	Mixed method	Psychological wellbeing**	Anthropometric profile**	Physical activity*	<b>Participant experiences</b> ( <i>enjoyed</i> : social support for increased motivation from peers and atmosphere, increased knowledge [aware of how to be active and incorporate into busy schedules], books, group discussion, access to health promotion professionals, introduction to pedometers; <i>disliked</i> : nothing; <i>suggested improvements</i> : more books, PA incorporated into meetings, structure of programme [longer], group composition [more diverse, similar age]); <b>behaviour change</b> (increased PA due to programme, change eating habits, decline in PA since post-intervention, some more action since post-intervention; <b>attitudes towards PA</b> (PA motivated by benefits: emotional/mental [happy, more energy], motivated to be active to [lose weight, get in shape, general quality of life], <i>barriers</i> included time [competing priorities including work, family], decreased social support, lack of motivation or accountability, poor weather conditions, accessibility to fitness facilities and services, childcare needs, physical constraints [injury, pain, morning sickness]; <b>self-worth</b> (ability to prioritise themselves, gain in confidence, ability to participate in PA and other life areas, gain in skills: incorporating PA into busy lives [small changes, baby steps], self-monitoring techniques [pedometer, journaling], however some did not, improved goal-setting ability and achieving their goals, continue to be in social support group and feel connected in pursuit of healthy change.
<b>Huberty et al., 2008</b>	Women Bound to be Active	Quantitative	Psychological wellbeing*	Anthropometric profile*	Physical activity*	N/A

Table 3A

*Detailed Summary of Empowerment Programme Outcome Measures*

Outcome Measures					
Investigation (cont.)	Intervention Name (cont.)	Psychosocial	Physical	Behavioural	Qualitative Methods
<b>Begin et al., 2018</b>	Choisir de maigrir?	<b>Self-perception</b> (Body esteem scale: appearance**, weight**), <b>psychological distress</b> (Beck depression inventory: depression**), <b>psychological wellbeing</b> (Rosenberg self-esteem scale: self-esteem**)	<b>Anthropometric profile</b> (weight, height, BMI)	<b>Eating behaviour</b> (TFEQ: Flexible restraint**, rigid restraint, disinhibition**, susceptibility to hunger**, restraint, intuitive eating scale: intuitive eating**, eating obsession and compulsive scale: obsessive-compulsive eating**)	N/A
<b>Carbonneau et al., 2017</b>		N/A	N/A	<b>Eating behaviour</b> (intuitive eating scale: eating for physical rather than emotional reasons**, unconditional permission to eat**, reliance on hunger and satiety cues**), <b>diet quality</b> (Health eating index: total fat*, fruits and vegetables*, variety*, cholesterol*)	N/A
<b>Leblanc et al., 2012</b>		N/A	<b>Anthropometric profile</b> (weight, height, BMI, waist-circumference)	<b>Eating behaviour</b> (TFEQ: cognitive restraint, disinhibition, hunger), <b>dietary intake</b> (3-day food record: energy, lipid, carbohydrate, protein, alcohol, fibers, sodium, calcium), <b>eating patterns</b> (3-day food record: meal frequency, snack frequency, energy from breakfast, energy from snacks, energy after 5pm, energy from snacks after 5pm), <b>physical activity</b> (3-day activity diary: mpa, vpa)	N/A

<b>Gagnon-Girouard et al., 2010</b>		<b>Self-perception</b> (Body-esteem scale: appearance**, weight**, attribution), <b>psychological distress</b> (Beck depression inventory: depressive symptoms**), <b>psychological wellbeing</b> (Culture-free self-esteem inventories: self-esteem**, Impact of weight on quality of life: quality of life**)	<b>Anthropometric profile</b> (weight**, height)	<b>Eating behaviour</b> (binge eating scale: binge eating**)	N/A
<b>Provencher et al., 2009</b>		N/A	<b>Anthropometric profile</b> (BMI, waist-circumference, hip circumference), <b>metabolic parameters</b> (LDL, HDL, cholesterol, triglycerides, blood pressure)	<b>Eating behaviour</b> (TFEQ: cognitive restraint, situational susceptibility to disinhibition**, situational susceptibility to hunger**), <b>appetite ratings</b> (desire to eat, hunger, fullness, prospective food consumption), <b>physical activity</b> (3-day activity diary energy expenditure: mvpa)	N/A
<b>Provencher et al 2007</b>		N/A	N/A	<b>Eating behaviour</b> (TFEQ: cognitive restraint, flexible restraint*, rigid restraint*, disinhibition*, habitual*, emotional*, situational*, hunger*, internal*, external*) <b>appetite ratings in fasting state:</b> desire to eat, hunger, fullness, prospective food consumption; <b>appetite ratings 1hr after meal:</b> desire to eat*, hunger*, fullness, prospective food consumption).	N/A
<b>Mensinger and Meadows, 2017</b>	HUGS	<b>Self-perception</b> (Weight Bias Internalisation Scale: Internalised weight stigma*)	N/A	<b>Physical activity</b> (RL-QOL: enjoyment of MPA*, engagement of MPA*)	N/A
<b>Mensinger, Calogero &amp; Tylka, 2016</b>		<b>Self-perception</b> (Weight Bias Internalisation Scale: Internalised weight stigma**)	N/A	<b>Eating behaviour</b> (Intuitive Eating Scale: intuitive eating**, Eating Disorder Examination Questionnaire: global**, restraint, eating concern**, weight concern**, shape concern**])	N/A

<b>Mensingher, Calogero, Stranges &amp; Tylka, 2016</b>		<b>Psychological wellbeing</b> (Rosenberg self-esteem scale: self-esteem**; RL-QOL: quality of life**); <b>psychological distress</b> (DASS-21: depression, anxiety, stress)	<b>Metabolic parameters</b> (venous blood: glucose, lipids [TC, LDL**, HDL*, TC-HDL ration, triglycerides]; blood pressure), <b>anthropometric profile</b> (weight, height, waist circumference*, hip circumference*, waist to hip ratio**)	<b>Physical activity</b> (RL-QOL: MPA**), <b>dietary intake</b> (Dietary Risk Assessment [of meats, side dishes/desserts/snacks, dairy/eggs and spreads/oils]**; RL-QOL: fruits and vegetables**); <b>eating behaviour</b> (intuitive eating scale: intuitive eating**)	N/A
<b>Tirlea et al. 2013 and 2016<sup>a</sup></b>	Girls on the Go! (Study 1)	<b>Psychological wellbeing</b> (Rosenberg self-esteem scale: self-esteem*), <b>psychological distress</b> (Eating disorders assessment: psychosocial impairment induced by eating disorders), <b>self-perception</b> (body esteem scale: body satisfaction; Eating Disorders Inventory: body dissatisfaction)	N/A	<b>Behavioural determinants</b> (Self-efficacy scale: physical health self-efficacy*, mental health self-efficacy*), <b>Eating behaviour</b> (Dutch Eating Behaviour Questionnaire for Children: [restrained eating, emotional eating, external eating]*).	N/A
	Girls on the Go! (Study 2)	<b>Psychological wellbeing</b> (Rosenberg self-esteem scale: self-esteem*†), <b>psychological distress</b> (Eating disorders assessment: psychosocial impairment induced by eating disorders), <b>self-perception</b> (body esteem scale: body satisfaction; Eating Disorders Inventory: body dissatisfaction)	N/A	<b>Behavioural determinants</b> (Self-efficacy scale: physical health self-efficacy*, mental health self-efficacy*), <b>Eating behaviour</b> (Dutch Eating Behaviour Questionnaire for Children: [restrained eating, emotional eating, external eating]§).	N/A
<b>Stromback et al., 2016</b>	Stress management course	<b>Self-perception</b> (Body Perception Questionnaire: grounding*, satisfaction with the body*, tension and pain, stomach problems*,			

		avoidance of listening to body signals*, vitality and bodily presence*, setting limits*, health anxiety*; Social analysis of social behaviour: positive self-image*, negative self-image*, <b>psychological distress</b> (Adult Self-Report scale: internalising problems* [anxiousness/depression*, withdrawn, somatic complaints*], thought problems*, attention problems, total problems*)			
<b>Stromback et al., 2013</b>		N/A	N/A	N/A	Open-ended interviews after course completion. Example questions: "Please tell me about your experiences of the course," "How do you experience stress and life now?" "What was most important in the course?" "Have you experienced any changes?" and in that case, "In what way?"
<b>Huberty et al, 2013</b>	Women Bound to be Active	<b>Psychological wellbeing</b> (Adult Self-Perception Profile: self-worth)	<b>Anthropometric profile:</b> (height, weight, BMI**b)	<b>Behavioural determinants</b> (benefits and barriers ratio scale: benefits and barriers to exercise**b); <b>Physical activity</b> (Modifiable Activity Questionnaire: leisure hrs/wk**b and MET/wk**b, occupational hrs/wk and MET/wk)	Phone interviews conducted after 1 year. Questions related to: current PA participation, perceived benefits of and barriers to PA, perceived social support, self-worth and quality of life, motivations for and perceptions of PA, goal setting, self-efficacy for participating in PA, reflections after WBA.

<b>Huberty et al, 2010</b>	Women Bound to be Active	<b>Psychological wellbeing</b> (Adult Self-Perception Profile: self-worth*)	<b>Anthropometric profile:</b> (height, weight, BMI)	<b>Behavioural determinants</b> (benefits and barriers ratio scale: benefits and barriers to exercise*); <b>Physical activity</b> (pedometers: step count/day*; 7-day recall questionnaire: kcals/day; Modifiable Activity Questionnaire: activity mode, frequency, duration; combined: 150 minutes of MVPA per week*)	N/A
<b>Huberty et al., 2009</b>	Women Bound to be Active	<b>Psychological wellbeing</b> (Adult Self-Perception Profile: self-worth**)	<b>Anthropometric profile:</b> (height, weight, BMI**)	<b>Physical activity</b> (7-day recall questionnaire: kcals/day*)	25 open-ended questions by questionnaire at one year follow up. Questions allowed women to explain their experiences with PA and the programme in their own words.
<b>Huberty et al., 2008</b>	Women Bound to be Active	<b>Psychological wellbeing</b> (Adult Self-Perception Profile: self-worth*)	<b>Anthropometric profile:</b> (height, weight*, BMI*)	<b>Physical activity</b> (pedometers: step count/day*; 7-day recall questionnaire: kcals/day*)	N/A

Notes: HAES = Health at Every Size; HUGS = Health-focused, Understanding lifestyle, Group supported, and Self-esteem building; RL-QOL = Red Lotus Health and Well-Being Questionnaire; for RCT study designs, significance was reported only for time or group by time significant differences

<sup>a</sup>Details regarding outcome measures obtained from trial protocol Tirlea et al., 2013

<sup>b</sup>Significant difference by group x time comparison between women who completed the programme and those who did not

\*Significant improvement at post-intervention

\*\*Significantly improved at one year follow up compared to baseline

†Significantly improved at follow up (3-6 months) compared to baseline

§Outcome significant at follow up but not post-intervention



## **Appendix D: Defining a Health Woman Survey**

A Snapshot of New Zealand Women's Approach to Health and Wellbeing

(Unpublished)

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## **Abstract**

Nationwide surveys reveal New Zealand (NZ) women experience poor mental and physical health outcomes. Health is holistic and requires a practice across multiple disciplines. This study investigated NZ women's health in physical activity (PA), nutrition, sleep and mental wellbeing. NZ women (n =116) aged 18-30 years completed surveys to assess each domain. Most women participated in adequate PA and consumed limited junk food; however, many women experienced poor sleep and mild depression. Few women achieved all four health domains with mental wellbeing as the least attainable. PA and nutrition in combination were accomplished more than any other combination. Women from this study may have an unbalanced focus on health emphasising PA and targeted areas of nutrition. These health patterns reflect weight-control strategies related to poor body image rather than a practice for overall health that must be considered for future health initiatives.

## **Keywords**

wellbeing; mental health; physical activity; nutrition; behaviour; sleep

## Introduction

Health and wellbeing is an ongoing challenge among New Zealand (NZ) women, with nearly three for every ten NZ women being obese (OECD, 2016) and nearly one in four women experiencing mood and/or anxiety disorders (Ministry of Health, 2015a). Upon further inspection, recent surveys indicate NZ women are less likely to meet the physical activity (PA) recommendations (Ministry of Health, 2013; Sport New Zealand, 2015), more likely to have difficulties sleeping (Li, Wing, Ho, & Fong, 2002; National Sleep Foundation, 2007; Paine, Gander, Harris, & Reid, 2004) and experience poor mental wellbeing (Ministry of Health, 2015a) compared to NZ men. The poor health outcomes are concerning for NZ women as overall good health and wellbeing are associated with a healthy practice in PA, nutrition, sleep and mental wellbeing (Conner, Brookie, Richardson, & Polak, 2015; Health Promotion Agency, 2017; Ministry of Health, 2015b; National Sleep Foundation, 2017; Prendergast, Mackay, & Schofield, 2016; Prendergast, Schofield, & Mackay, 2016). However, findings from a nationwide survey conducted by the Ministry of Health (2015a) reveal NZ women may be more successful in some health areas (i.e. fruit and vegetable intake) compared to others (i.e. PA, sleep and mental wellbeing).

The definition of health exemplifies that it is multidisciplinary by integrating the dimensions of physical, mental and social wellbeing (World Health Organization, 1948). Experts have challenged the health definition to further encompass the interactions between a wide variety of health determinants (Bircher & Kuruville, 2014; Tinetti & Fried, 2004) and the ability to self-manage and adapt to changing contexts (Charlier et al., 2017; Huber, 2010; Huber et al., 2011). Given that health is multi-faceted and dynamic, women's health behaviours should be explored across multiple health domains to better investigate their health. PA, sleep, nutrition and mental wellbeing were identified as key health domains to explore because healthy behaviours within these areas are associated with better health and wellbeing (Ministry of Health, 2015b; Prendergast, Schofield, et al., 2016). Furthermore, the clustering of healthy lifestyle behaviours also predicts optimal wellbeing in NZ adults (Prendergast, Mackay, et al., 2016). While health

behaviours of NZ women have been explored (Keller-Olaman, Williams, Knight, & McGee, 2004; Kruger et al., 2015; S. L. Leong, Madden, Gray, & Horwath, 2013; Lloyd & Little, 2010; Ministry of Health, 2015a; Prendergast, Mackay, et al., 2016; Prendergast, Schofield, et al., 2016; Slater, Brown, McLay-Cooke, & Black, 2016), to our knowledge, no recent study has reported on the patterns of NZ women's health practice across all four areas. This study investigates NZ women's health practice using selected elements of PA, nutrition, sleep and mental wellbeing to better describe their overall health and wellbeing.

## **Method**

### **Participants and Procedure**

This study was a cross-sectional survey conducted at Massey University's Wellington campus between October 2014 and August 2015. NZ women aged 18-30 years were recruited from the greater Wellington region via flyers posted at universities, health and fitness centres, community centres and by word of mouth. Women who responded ( $n = 119$ ) to recruitment strategies were screened to ensure they had regular menstrual cycles for the past year, were not pregnant or breastfeeding, and were not diagnosed of any serious ailments (e.g. heart disease, diabetes and cancer). After screening, 116 women were eligible and enrolled into the study upon receiving informed and signed consent. Participants attended a single morning session with the lead investigator. Each woman completed a series of questionnaires accessed online using Qualtrics survey software (Provo, UT) from an on-site computer. In order to avoid influencing results, the lead investigator was available to answer any questions, but was absent from the testing space. This study received ethical approval from its institutional review board (Massey University Human Ethics Committee: Southern A, Application 14/01).

### **Measures**

All questionnaires asked participants to report on the past four weeks prior to their testing session. Surveys were administered in the same order for all participants and took approximately 35 minutes to complete in total.

**Physical Activity.** Women completed the Recent Physical Activity Questionnaire (RPAQ) (approximately ten minutes) to determine the amount of time they spent at various PA intensities (sedentary, light, moderate and vigorous) (Besson, Brage, Jakes, Ekelund, & Wareham, 2010). Using the RPAQ, women reported their usual PA across four areas (work, travel, recreation and domestic life). All activities were assigned a metabolic equivalent task (MET) obtained from the Compendium of Physical Activities (Ainsworth et al., 2011) and accordingly categorised by intensity level: sedentary (< 1.5 MET); light (1.5 to < 3 MET), moderate (3 to 6 MET); and vigorous (> 6 MET) (Besson et al., 2010). Duration of time spent doing each activity was then summed providing the amount of time (hours) the women spent for each intensity level.

Moderate and vigorous categories were combined to provide a moderate- to vigorous-intensity PA (MVPA) category (>3 MET) (Golubic et al., 2014). National recommendations guided the achievement for PA (Figure 1). Women achieved the PA domain if their reported MVPA time was equal to or above the recommended 150 minutes of MVPA by the Ministry of Health (2015b). Validation studies on the RPAQ have demonstrated a strong association between self-reported and objectively measured VPA time ( $r = 0.70$ ,  $P < 0.0001$ ) (Besson et al., 2010) and relative validity for self-reported and objectively measured MVPA time ( $\rho = 0.18$ , 95% CI: 0.13-0.23,  $p = 0.003$ ) across ten European countries (Golubic et al., 2014).

**Nutrition.** Five questions from the New Zealand Adult Nutrition Survey (NZANS) (Ministry of Health, 2008) were used to measure the consumption of healthy food choices (specifically fruit and vegetables) and unhealthy foods (specifically takeaways, chips, and soft drinks). For fruit and vegetable intake, women reported how many servings of each (less than one, one, two, three, four or more) they consumed per day. Takeaways, chips and soft drinks were each reported as the number of times eaten per week (less than once, one to two times, three to four times, five to six times, seven times or more). Validity for the NZANS is justified in the NZANS Methodology Report (University of Otago & Ministry of Health, 2011b) stating that the 2008/09 NZANS applied standard frameworks, classifications and validated questions where possible under the Protocols of Official Statistics (Statistics New Zealand, 1998). The five questions

selected for this study were answered among other food frequency questions derived from the NZANS that took approximately 20 minutes to complete in total.

For healthy food choices, reported servings for fruit and vegetables were compared to the national guidelines of eating at least five servings of fruit and vegetables (Ministry of Health, 2015b). For unhealthy food choices, consuming each more than three times per week was considered an unhealthy intake (University of Otago & Ministry of Health, 2011a; World Cancer Research Fund & American Institute for Cancer Research, 2007). In order to achieve the overall nutrition health domain, women had to consume at least five servings of fruit and vegetables (a minimum of three vegetable servings were required as outlined in the guidelines (Ministry of Health, 2015b)) per day and limit each intake of takeaways, chips and soft drinks to less than three times per week (Figure 1).

**Sleep.** The Pittsburgh Sleep Quality Index (PSQI) (Buysse, Reynolds III, Monk, Berman, & Kupfer, 1989) assessed seven components of sleep (subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medication and daytime dysfunction) based on 19 self-rated items. Each of the seven components were scored from zero (very good) to three (very bad). Achievement for the sleep domain was determined by scoring within normal ranges demarcated by the questionnaire. Scoring a two or higher (fairly bad or worse) was considered experiencing poor sleep relative to that specific sleep component. The sum of all component scores provided a global sleep score that classified participants as experiencing good (scored  $\leq 5$ ) or poor (scored  $> 5$ ) sleep (Buysse et al., 1989). One of the 19 items allowed women to report any additional sleep disturbances they experienced that were then quantifiably scored the same as the other items. While reported barriers did not directly influence domain achievement, they provided a better understanding surrounding sleep issues experienced by the women.

Validity of the PSQI is supported by its ability to significantly discriminate ( $p < 0.001$ ) between control and clinical groups who experience troubled sleep (Backhaus, Junghanns, Broocks, Riemann, & Hohagen, 2002; Buysse et al., 1989; Carpenter & Andrykowski, 1998).

Survey completion time averaged between five and ten minutes. Women were considered to achieve the sleep health domain if they scored a five or less for the global sleep score indicating good sleep (Figure 1).

**Mental Wellbeing.** Mental wellbeing was assessed using a 20-item depression scale developed by the Centre for Epidemiology Science (CES-D) (Radloff, 1977). Women had to indicate how often (rarely, some of the time, a moderate amount of time, or all of the time) they experienced depressive symptoms (e.g. felt sad, lonely, restless) within the past four weeks producing a score that could be classified as exhibiting signs of severe (24+), moderate (16-24), mild (10-15) or no signs (0-9) of depression. Achievement for the mental wellbeing domain was determined by scoring within normal ranges demarcated by the questionnaire (Figure 1). Women required a score less than ten indicating no signs of depression as seen in previous studies (Chen et al., 2009) in order to achieve the mental wellbeing domain. The CES-D has been well-validated in its ability to assess severity of depressive symptoms and screen for depression in diagnosed and undiagnosed persons (Husaini, Neff, Harrington, Hughes, & Stone, 1980; Myers & Weissman, 1980; Radloff, 1977; Roberts & Vernon, 1983). Average survey completion time was ten minutes.

### **Statistical Analysis**

Thematic analysis was used to evaluate the reported sleep barriers for the open-ended PSQI question. Reported Barriers were listed, categorised and then assessed for frequency. Chi-Square Goodness-of-Fit Tests were run to determine NZ women's likelihood to achieve domain components (specifically for healthy and unhealthy food choices within the nutrition domain and component scores for sleep health domain) and for the overall achievement for each domain (Table 1). Women were also assessed based on how many health domains they achieved with zero being the lowest and four being the highest number of possible domains they could achieve. Chi-Square Goodness-of-Fit Tests determined the likeliness for the quantity of domains each woman achieved and the combination of domain types that were achieved for the women who achieved multiple health domains (Table 2). All Goodness-of-Fit tests were run based on the assumption that women were equally likely to succeed as they were to fail (50%) (or score equally in the case

of sleep components). Furthermore, Chi-Square proportions tests determined any associations between the achievements of domain type.

## Results

After screening, the study included a sample of 116 women ( $M_{age} = 23.23$  years,  $SD = 2.72$ ;  $M_{BMI} = 22.79$  kg/cm<sup>2</sup>,  $SD = 3.74$ ). Participants predominantly identified as European (75.9%), but also Asian (9.5%), Māori (6.9%), Pacific (2.6%) and Middle Eastern/Latin American/African (5.2%) by selecting from a list of ethnic groups guided by the NZ census (Statistics New Zealand, 2013).

### Physical Activity

Within one day, women spent an average of 18.28 (SD:  $\pm 2.98$ ) hours in sedentary behaviour (including sleep), 3.42 (SD:  $\pm 4.73$ ) hours in light-intensity PA, 1.26 (SD:  $\pm 0.99$ ) hours in MPA and 0.58 (SD:  $\pm 0.86$ ) hours in VPA. Nearly all of the women sampled ( $n = 110$ , 94.8%) met the 150 minute guidelines of MVPA and thus were significantly more likely to achieve the PA domain than not ( $X^2(1) = 93.24$ ,  $P < 0.001$ ) (Table 1).

### Nutrition

Approximately two-thirds of women ( $n = 79$ , 68.1%) reported eating at least three servings of vegetables per day and nearly three-quarters of women ( $n = 84$ , 72.4%) reported eating at least two servings of fruit per day (Table 1). However, the level of achievement fell to just over half of the women ( $n = 67$ , 57.8%) when considering the recommended guidelines of at least five servings of fruit and vegetables. Most women ( $n = 101$ , 87.1%) were successful at limiting takeaways, chips and soft drinks to less than three times per week. Significantly more women succeeded at limiting unhealthy food choices ( $X^2(1) = 63.76$ ,  $P < 0.001$ ) compared to consuming at least five fruit and vegetable servings ( $X^2(1) = 2.79$ ,  $P = 0.095$ ) (Table 1). Only half of the women ( $n = 61$ , 57.8%) met all of the parameters for both consuming healthy and limiting unhealthy food choices (fruit, vegetables, takeaways, chips and soft drinks). There were no

significant findings between the women who achieved the nutrition health domain and those who did not.

### **Sleep**

The most prevalent sleep components women reported as ‘fairly bad’ or worse included sleep efficiency (trouble staying asleep) ( $X^2(6) = 37.5, P < 0.001$ ) and sleep latency (difficulty falling asleep) ( $X^2(6) = 22.04, P < 0.001$ ) (Table 1). Of the 116 women surveyed, 26.7% ( $n = 31$ ) reported additional barriers to achieving good sleep. Reported barriers included stress/anxiety ( $n = 10, 32.3\%$ ), disturbance from partner ( $n = 5, 16.1\%$ ), environment (e.g. noise, pets, earthquakes) ( $n = 5, 16.1\%$ ), irregular sleeping patterns ( $n = 4, 12.9\%$ ), and other disturbances (e.g. children, illness, medication, pain, vivid dreaming) ( $n = 7, 22.6\%$ ). Over half of the women ( $n = 66, 56.9\%$ ) scored above five for overall PSQI score consequently classifying them as poor sleepers. Thus less than half of the women ( $n = 50, 43.1\%$ ) achieved the sleep health domain (Table 1). No significant differences were found between the women who achieved the sleep domain and those who did not.

### **Mental Wellbeing**

The CES–D revealed over half of the women ( $n = 78, 67.2\%$ ) reported signs of depression during the previous four weeks with nearly a quarter ( $n = 28, 24.1\%$ ) of those women producing scores as experiencing moderate to severe depression (Table 1). Women were more likely to report signs of depression than not ( $X^2(1) = 13.79, P < 0.001$ ) leaving approximately one-third of women ( $n = 38, 32.8\%$ ) who managed to achieve the mental wellbeing health domain.

### **Comprehensive Health**

For comprehensive health, women were assessed on how many of the four health domains they achieved. PA was the highest achieved domain followed by nutrition, sleep and mental wellbeing respectively (Figure 2). When comparing the type of health domains achieved, women were significantly more likely to achieve the PA domain ( $X^2(3) = 31.62, P < 0.001$ ) and less likely

to achieve the mental wellbeing domain ( $X^2(3) = 11.05, P < 0.00001$ ) compared to the other health domains.

After accounting for all of the health domains, the majority of women ( $n = 89, 76.7\%$ ) met at least two health domains and only a small proportion of women achieved all four ( $n = 13, 11.2\%$ ) (Figure 3). The PA and nutrition combination was achieved significantly more frequently ( $X^2(2) = 51.14, P < 0.001$ ) by women compared to PA and sleep ( $X^2(2) = 2.13, P < 0.001$ ) and PA and mental wellbeing ( $X^2(2) = 0.10, P < 0.001$ ) (Table 2). There were no significant differences between combinations for those who completed three domains.

## **Discussion**

This study investigated women's health across PA, nutrition, sleep and mental wellbeing. The majority of the women from the current study (94.8%) participated in at least 150 minutes of exercise in the past week (Ministry of Health, 2015b). These findings exceed women's physical activity rates reported in the most recent nationwide survey (45.2%, 15-24 years; 48.7%, 25-34 years) (Ministry of Health, 2014) and international surveys from the United States (48.8%, all years) (U.S. Department of Health and Human Services, 2015), Australia (57.0%, 18-24 years; 57.6%, 25-34 years) (Australian Bureau of Statistics, 2016) and England (75.5%, 16-24; 67.1%, 25-34 years) (Sport England, 2017). Several possibilities may explain this incongruence. Firstly, recruitment methods created a sample selection bias by attracting women responsive to flyers posted at health facilities and universities. As a result, the respondents were predominately urban and educated women who likely had a pre-existing knowledge and/or interest in health that may have contributed to the higher PA rates observed. Additionally, the sample overrepresented NZ European women, and thus underrepresented the rest of the general population. National surveys have identified Māori, Pacific and Asian adults more likely to be physically inactive in comparison (Ministry of Health, 2015a; Sport New Zealand, 2015) potentially affecting the PA rates in this study. Furthermore, the younger age of the sample may also explain the prevalence of high PA levels as this age group only represents a proportion of women in the population. Women older than 30 years tend to report more physical and mental health barriers to regular participation in

PA (Zimmermann, Carnahan, & Peacock, 2016) and their absence from the sample could produce a higher observed PA rate.

Despite most women's achievement for the PA domain in this study, the majority of women did not attain the mental wellbeing domain. PA is positively associated with self-rated mental wellbeing (Marques et al., 2016) that differs from the current study's findings. High achievement of PA combined with low achievement for mental wellbeing may be explained by PA being motivated by external appearance. Body dissatisfaction is experienced by a large proportion of NZ women (Curtis & Loomans, 2014; Miller & Halberstadt, 2005; Talwar, Carter, & Gleaves, 2012; Utter et al., 2008) and more likely to be experienced by European women (Talwar et al., 2012). Not only is body dissatisfaction linked with women's poor mental wellbeing (Jackson et al., 2014; Waghachavare, Quraishi, Dhumale, & Gore, 2014), but it has also been shown to motivate appearance driven PA that weakens the relationship between PA and positive body image (Homan & Tylka, 2014). Compulsive PA driven by body dissatisfaction may explain the high rates of poor mental wellbeing co-existing with high rates of PA in this study.

Most NZ women limited takeaways, chips and soft drinks to less than three times per week, but were less successful at consuming the recommended five servings of fruit and vegetables per day. Regular PA and the reduction of unhealthy fats are behaviours consistent with weight control strategies previously identified among NZ women (S. L. Leong et al., 2013). While these practices fall within the national recommendations, it is concerning that only about half of the group (57.8%) achieved the recommended five or more servings for fruit and vegetables per day signifying the healthy nutrition practices. Slater et al. (2016) identified nearly half of the women sampled in their research ( $n = 109$ ) who participated in recreational exercise were considered at risk for low energy availability (insufficient energy intake in conjunction with exercise). These findings suggest NZ women may not be fuelling their bodies enough potentially placing greater emphasis on limiting unhealthy foods rather than consuming enough healthy foods.

Over half of the women (56.9%) experienced poor sleep particularly around the time it takes to fall asleep and continue sleeping throughout the night. Stress and anxiety were the most commonly reported barriers to a good night's sleep. Reports of stress and anxiety around sleep are consistent with women's high rates of poor mental wellbeing. Previous studies have identified the relationship between poor sleep, stress and anxiety (Chang et al., 2014; National Sleep Foundation, 2007; Quan et al., 2016; Wang et al., 2016) and poor sleep and poorer wellbeing (Prendergast, Schofield, et al., 2016) among women. Thus there is evidence to suggest poor mental wellbeing may be posing as a barrier to getting a good night's sleep for young NZ women.

Very few women successfully achieved all of the four health domains with the majority of women meeting only two health areas, particularly, the PA and nutrition in combination. Sleep and mental wellbeing were the least likely health domains to be achieved and may be receiving less attention compared to PA and nutrition. NZ women's prevalent focus on PA and nutrition domains may be explained by the preponderance of weight-focused initiatives alongside general health promotion (Sook Ling Leong, Gray, Haszard, & Horwath, 2016; S. L. Leong et al., 2013; Ministry of Health, 2015b; Santos et al., 2010; University of Otago & Ministry of Health, 2011a) in the context of the obesity epidemic. The dominant pattern of policies and research related to body weight in combination with the media's popular portrayal of the ideal body is termed the 'weight-centred health paradigm' (WCHP) (Bacon & Aphramor, 2011). Previous studies have identified that NZ women are concerned with their weight (Curtis & Loomans, 2014; S. L. Leong et al., 2013; Miller & Halberstadt, 2005; Talwar et al., 2012; Utter et al., 2008; Wood et al., 2012). Furthermore, many women (normal and overweight) have adopted weight-control strategies (S. L. Leong et al., 2013; Utter et al., 2008) that are largely ineffective long-term and risk mental and physical wellbeing (Tylka et al., 2014). NZ women may benefit from health promotion initiatives that extend beyond weight-loss.

This study has several strengths. Women's health was assessed across for four health domains, specifically PA, nutrition, sleep and mental wellbeing. Using a wide lens of women's health revealed areas women were achieving more (PA and nutrition) and less (sleep and mental

wellbeing). Furthermore, investigating women's achievement across all four health domains highlighted this group of women's limited focus to physical health reflecting patterns consistent with weight-loss strategies. These findings provide evidence to support holistic approaches to women's health and wellbeing that expand beyond physical health.

The current study is not without limitations. Findings from this investigation are restricted by a small sample size of predominantly young, European NZ women. Care must be taken when interpreting results from this study when considering the age and ethnic composition of the wider population. While these findings cannot be directly generalised to New Zealand's indigenous Māori population, body concern related to weight-loss practices have been detected in young women of this group (Talwar et al., 2012) and behaviour patterns among Māori women require further investigation. Moreover, health domain achievement was limited to several measures that could be assessed more comprehensively in future studies. For example, this investigation reported on women's participation in aerobic PA, however, muscle strengthening is also an important component that has specific recommendations in the national guidelines (Ministry of Health, 2015b). Another example is the nutrition domain achievement was based on the self-reported consumption frequency of five food items, and is not representative of the entire diet consumed.

Future studies could investigate a larger sample size representative of the general population of NZ women to perform a more in-depth multivariable analysis. Rather than self-reported data, measures could either be objective (rather than self-reported) or more comprehensive (e.g. aerobic and strength fitness tests for PA, food diary assessment for nutrition, positive wellbeing measures for mental wellbeing). Women's health could be further examined by including additional domains (e.g. social health, body satisfaction) or by exploring the same domains in other ethnic and/or international populations to see how domain achievement varies between contexts.

## **Conclusion**

The majority of women sampled in this study successfully met PA recommendations and limited unhealthy food choices. While these behaviours are consistent with national guidelines, they are also reflective of behaviour patterns driven by body dissatisfaction and weight-loss. PA and nutrition were also the most achieved health domains in combination. NZ women from this study may have an unbalanced focus on health emphasising PA and nutrition health domains compared to mental wellbeing and sleep. Poor rates of mental wellbeing and sleep may indicate these health areas are barriers to achieving good overall health and wellbeing. The preliminary findings from this research encourage a comprehensive approach to improve women's overall health and wellbeing. Future health initiatives for NZ women can address developing a healthy sleep routine, balanced eating pattern and practicing stress management to ultimately work towards a more balanced health practice among NZ women in the pursuit of good integrated health. Trends identified in this study are insightful for future research, particularly concerning young, NZ women and add to the small knowledge base regarding the practice of NZ women's multiple health behaviours.

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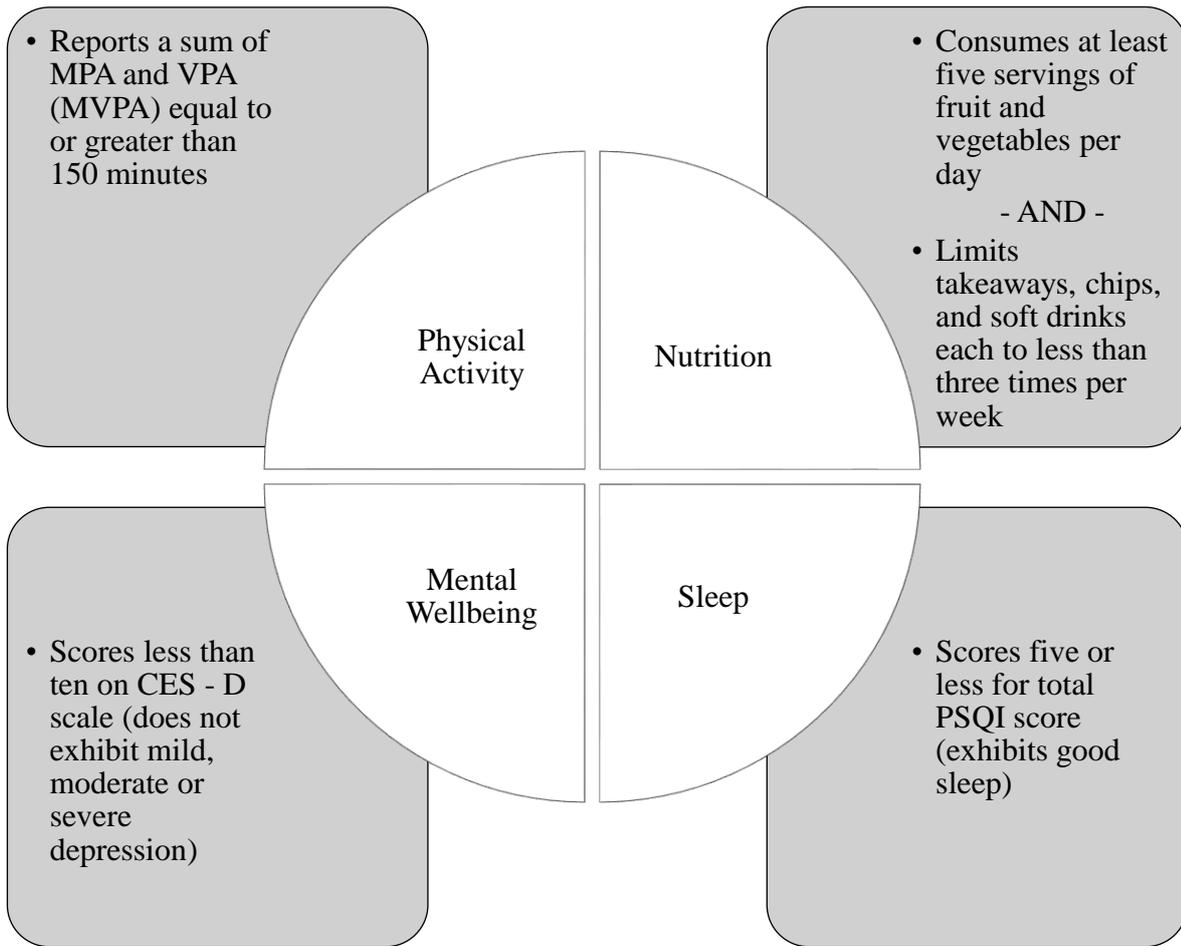
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*Figure 1.* Criteria for the achievement of each health domain are described. National recommendations guided the criteria for physical activity (Ministry of Health, 2015b) and nutrition (Ministry of Health, 2015b; University of Otago & Ministry of Health, 2011a; World Cancer Research Fund & American Institute for Cancer Research, 2007). Questionnaire scoring guidelines defined the criteria for mental wellbeing (Radloff, 1977) and sleep (Buysse et al., 1989). Moderate-intensity physical activity (MPA), vigorous-intensity physical activity (VPA), moderate- to vigorous-intensity physical activity (MVPA), Center for Epidemiologic Studies Depression Scale (CESD), Pittsburgh Sleep Quality Index (PSQI).

Table 1

*Health domains and their components women achieved by frequency (n = 116)*

<b>Health Domain</b>	<b>Domain and Component Achievement</b>	<b>n</b>	<b>%</b>
Physical Activity	<b>Women who achieved the physical activity domain</b>	<b>110</b>	<b>94.8</b>
	At least 150 min of MVPA (sum of MPA and VPA min)		
	Participated in at least 150 minutes of MPA	96	82.8
	Participated in at least 75 minutes VPA	81	69.8
Nutrition	<b>Women who achieved nutrition domain</b>	<b>61</b>	<b>52.6</b>
	Consumed at least 5+ servings of fruit and vegetables per day and limited takeaways, chips and soft drinks to less than 3x per week		
	5+ servings of fruit and vegetables*	67	57.8
	2+ servings of fruit	84	72.4
	3+ servings of vegetables	79	68.1
	Limited all unhealthy food choices to less than 3x per week**	101	87.1
	Limited takeaways to less than 3x per week	112	96.6
	Limited chips to less than 3x per week	109	94.0
	Limited soft drinks to less than 3x per week	112	96.6
Sleep	<b>Women who achieved sleep domain</b>	<b>50</b>	<b>43.1</b>
	Scored $\leq 5$ for overall PSQI sleep score classifying as a good sleeper		
	Experiences poor sleep (overall PSQI score > 5)	66	56.9
	Poor sleep due to duration†	1	0.9
	Poor sleep due to disturbance†	23	19.8
	Poor sleep due to latency†	42	36.2
	Day Dysfunction due to Sleepiness†	28	24.1
	Poor sleep due to efficiency†	54	46.6
	Poor sleep due to quality†	19	16.4
Need for medication to sleep†	1	0.9	
Mental Wellbeing	<b>Women who achieved mental wellbeing domain</b>	<b>38</b>	<b>32.8</b>
	Scored < 10 for CES-D not experiencing signs of depression		
	Not depressed (scored 0-9)	38	32.8
	Mild Depression (scored 10-15)	50	43.1
	Moderate Depression (scored 16-24)	23	19.8
	Severe Depression (scored 24+)	5	4.3

\*At least three servings of vegetables required to achieve 5+ servings of fruit and vegetables.

\*\*Each unhealthy food choice (takeaways, chips and soft drinks) was limited to less than three times per week.

†Scoring a two or greater (fairly bad or worse) was classified as experiencing poor sleep for each of the seven sleep components.

*Note.* Moderate-intensity physical activity (MPA), moderate- to vigorous-intensity physical activity (MVPA), minutes (min), three times (3x), Pittsburgh Sleep Quality Index (PSQI), Center for Epidemiologic Studies-Depression Scale (CES-D)

Table 2.

*Quantity of health domains and domain type combinations women achieved by frequency (n = 116)*

<b>Domains Achieved</b>	<b>Type of Health Domain</b>	<b>n</b>	<b>%</b>
0 Domains	None	1	0.9
1 Domain	All Domain Types	26	22.4
	Physical Activity	21	80.8
	Mental Wellbeing	3	11.5
	Nutrition	1	3.8
	Sleep	1	3.8
2 Domains	Any Combination	47	40.5
	Physical Activity/Nutrition	28	59.6
	Physical Activity/Sleep	12	25.5
	Physical Activity/Mental Wellbeing	7	14.9
3 Domains	Any Combination	29	25.0
	Physical Activity/Sleep/Nutrition	14	48.3
	Physical Activity/Sleep/Mental Wellbeing	10	34.5
	Physical Activity/Mental Wellbeing/Nutrition	5	17.2
4 Domains	Physical Activity/Nutrition/Sleep/Mental Wellbeing	13	11.2

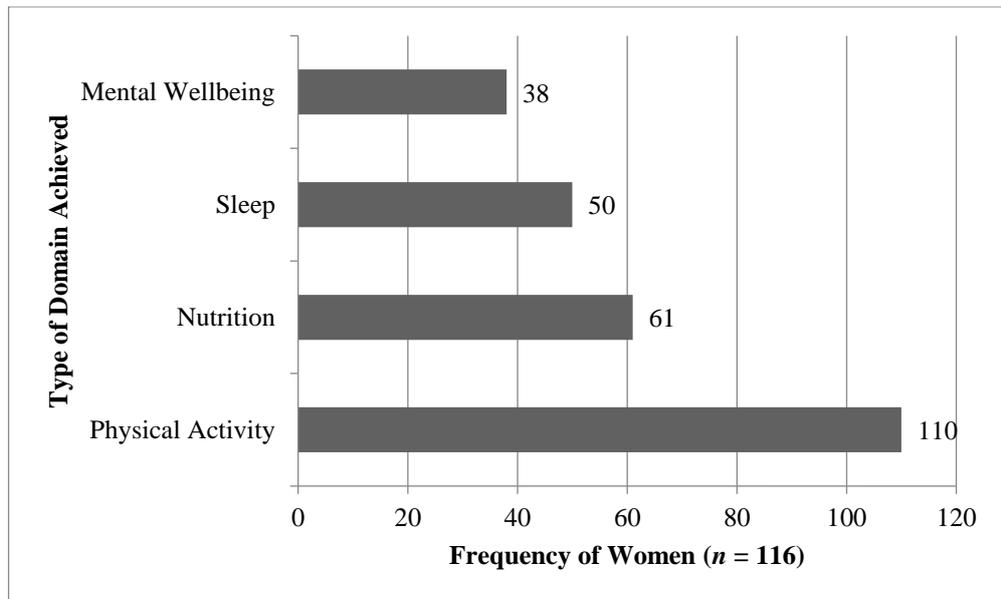


Figure 2. Type of domains women achieved by frequency.

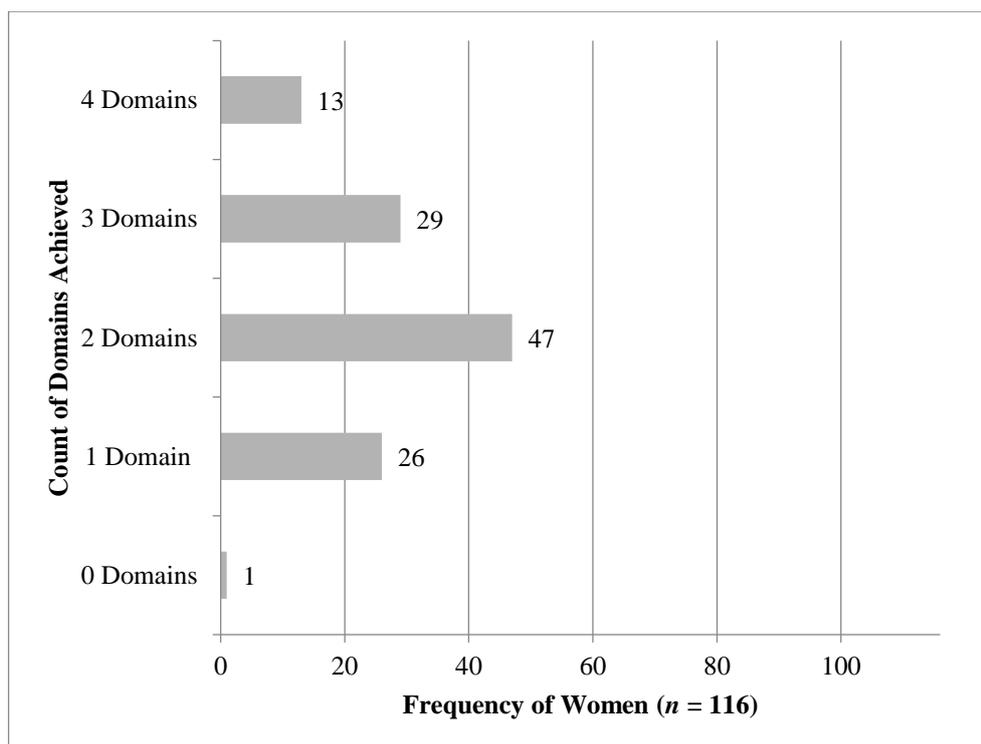


Figure 3. Quantity of domains women achieved by frequency.



## Appendix E: Goal Outline for Health Planning Example

HEALTH CATEGORIES	LEVEL	NEXT LEVEL HEALTH GOAL OUTLINE
Physical Activity	4	<p><b>Aerobic Activity Frequency (at least 10 min sessions)</b>            2. 20-25 min daily or equivalent (140-175 min/wk). This can be accomplished by doing aerobic activity 20-25 min/day; 30 min on five days; two 60 min classes and a 20-30 min activity; or one activity lasting 2hr 20min activity.  <i>Tips: Some ideas for aerobic activity include morn/afternoon/eve walks, parking far and walking, commute bike/walk, recreational activity, team sport, run/jog, stairs, gym activity, pilates, martial arts, outdoor hiking, surfing, climbing, yoga, etc.</i></p>
Sleep	3	<p><b>Avoid bright, artificial light before bed 4-7 nights/wk</b>            2. RECOMMENDED: Avoid artificially lit screens 30-90 min before bed (i.e. T.V., lap top, computer, cell phone, alarm clock) Bonus: Include avoiding bright lights and/or extend to 2 hours.  <i>Tip: Examples of bright screens include T.V., lap top, computer, cell phone, alarm clock, etc.</i></p>
Nutrition	2	<p><b>Sodium 2-4 times/wk</b>            1. Look at the nutrition labels and choose a lower sodium option of a favourite canned/packaged food (i.e. pasta sauce, crackers, dressing, soup, soy sauce etc.) aim for &lt;300 mg sodium/100 g on nutrition labels  <i>Tip: When doing this 2-4 times/wk it is meant to be something that is constantly on your mind, but you can state 2 specific times you did it each week.</i></p>
Eating Behaviour	3	<p><b>Creating/Experimenting 1-2/wk</b>            1. Try cooking a new dish or experiment a different cooking method for new or favourite meals (i.e. boiling, roasting, steaming, baking, poaching)</p>
Self-Care	3	<p><b>Self-appreciation/Treat day 30-60 min/wk</b>  <i>IDEAS: Writing/Journaling: write what you love about yourself. Self-Appreciation: Do something to appreciate yourself like op-shopping/shopping, manicure/pedicure, paint your nails, haircut, physical activity (energising/strong),</i></p>
Stress Management	4	<p><b>Acting on stress management 30-60 min/wk.</b>  <i>Incorporate one of the small goals to either help control or manage your stress.</i></p>



# Appendix F: Brainstorming Sheeting for Health Planning

HEALTH CATEGORIES	PERSONAL GOAL PLAN	
Physical Activity		
Sleep		
Nutrition		
Eating Behaviour		
Self-Care		
Stress Management		



## Appendix G: Weekly Checklists for Goal-Tracking

<b>EXAMPLE</b>										Completed Goal This Week?
Notes	Day	Mon 1	Tues 2	Wed 3	Thurs 4	Fri 5	Sat 6	Sun 7		
<b>PHYSICAL ACTIVITY</b>	Stretch neck and back 2-4 times each week for 15 min	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<b>WEEK 1</b>										Completed Goal This Week?
Notes	Day	1	2	3	4	5	6	7		
<b>PHYSICAL ACTIVITY</b>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Yes No
<b>SLEEP</b>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Yes No
<b>NUTRITION</b>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Yes No
<b>EATING BEHAVIOUR</b>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Yes No
<b>SELF-CARE</b>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Yes No
<b>STRESS MANAGEMENT</b>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Yes No
<b>WEEK 2</b>										Completed Goal This Week?
Notes	Day	1	2	3	4	5	6	7		
<b>PHYSICAL ACTIVITY</b>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Yes No
<b>SLEEP</b>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Yes No
<b>NUTRITION</b>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Yes No
<b>EATING BEHAVIOUR</b>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Yes No
<b>SELF-CARE</b>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Yes No
<b>STRESS MANAGEMENT</b>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Yes No

WEEK 3										Completed Goal This Week?	
	Notes	Day	1	2	3	4	5	6	7	Yes	No
PHYSICAL ACTIVITY			<input type="checkbox"/>								
SLEEP			<input type="checkbox"/>								
NUTRITION			<input type="checkbox"/>								
EATING BEHAVIOUR			<input type="checkbox"/>								
SELF-CARE			<input type="checkbox"/>								
STRESS MANAGEMENT			<input type="checkbox"/>								

WEEK 4										Completed Goal This Week?	
	Notes	Day	1	2	3	4	5	6	7	Yes	No
PHYSICAL ACTIVITY			<input type="checkbox"/>								
SLEEP			<input type="checkbox"/>								
NUTRITION			<input type="checkbox"/>								
EATING BEHAVIOUR			<input type="checkbox"/>								
SELF-CARE			<input type="checkbox"/>								
STRESS MANAGEMENT			<input type="checkbox"/>								

What worked?? Comments (Example: Stretching in the morning worked the best on busy days!)


## **Appendix H: Monthly Motivational Text Messages**

### **MONTH 1**

You are about halfway through your first month of Next Level Health! This is a good time to check in with yourself. If you are doing well on your goals, awesome! Keep it up!! If you are finding one or more goals a little challenging, that's okay too! Try making some changes to make them more realistic and make you more successful. Small changes do make a difference over time so do what you can achieve! Good luck and I'll see you soon! Victoria 😊

### **MONTH 2**

Remember – doing something small is much better than doing nothing at all and frequently making small healthy choices goes a long way! It's the little choices we make everyday that help shape who we are (it's deep, but true!). See you soon! Victoria 😊

### **MONTH 3**

You are near your halfway point of Next Level Health, well done! Instead of focusing on what you have missed this week, recognise all the different things you DID do and be proud 😊 Keep making proactive choices!

### **MONTH 4**

Take a moment and remind yourself why you decided to make small changes to benefit your health. What is your intent behind your goals? Do you feel proud of what you do for your body? Consider where you started and where you are now to refocus your overall aims and keep going!

## **MONTH 5**

How have your small goals evolved over the past few months? Are you growing a few habits? They may seem minor at first, but if you continue to develop and build them into your life, they will grow into something much bigger during your continuous journey towards good health. Keep focusing on what you can control 😊

## **MONTH 6**

Good health is a unique and continuous journey – not an endpoint. While you may be near the end of your time in Next Level Health, you will always be forming new habits and tweaking the ones you have as you change throughout your life. Go with the flow and keep making small, proactive choices to find balance and pursue good health for now and for your future!

## Appendix I: Recent Physical Activity Questionnaire

This questionnaire is designed to find out about your physical activity in your everyday life in the past 4 weeks. The questionnaire is divided into three sections. Please answer every question. Section A asks about your physical activity patterns in and around the house. Section B is about travel to work and your activity at work. Section C asks about recreations that you may have engaged in during the last four weeks.

### SECTION A: PHYSICAL ACTIVITY AROUND THE HOUSE

Getting about:

1. Which form of transport have you MOST OFTEN used in the last 4 weeks APART from your journey to and from work?

Car/motor vehicle (1.5)

Walk (3.3)

Public Transport (1.0)

Cycle (6.0)

TV, DVD or Video viewing:

2. On average over the last 4 weeks, how many hours per day have you watched TV, DVD or video?

	None (0)	Less than 1 hour per day (0.5)	1 to 2 hours per day (1.5)	2 to 3 hours per day (2.5)	3 to 4 hours per day (3.5)	More than 4 hours per day (4.5)
On a weekday before 6pm	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
On a weekday after 6pm	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
On a weekend day before 6pm	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
On a weekend day after 6pm	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Computer use at HOME but NOT AT WORK (e.g. internet, email, PlayStation, Xbox, Gameboy, etc.):

3. On average over the last four weeks, how many hours per day have you used a computer at home?

	None (0)	Less than 1 hour per day (0.5)	1 to 2 hours per day (1.5)	2 to 3 hours per day (2.5)	3 to 4 hours per day (3.5)	More than 4 hours per day (4.5)
On a weekday before 6pm	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
On a weekday after 6pm	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
On a weekend day before 6pm	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

On a weekend day after 6pm	<input type="radio"/>					
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Q6 Stair climbing at home:

4. On average over the last 4 weeks, how many times each day have you climbed up a flight of stairs (approx. 10 steps) at home?

	None (0)	1 to 5 times per day (3)	6 to 10 times per day (8)	11 to 15 times per day (13)	16 to 20 times per day (18)	More than 20 times per day (23)
On a weekday (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
On a weekend day (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## SECTION B: TRAVEL TO WORK AND ACTIVITY AT WORK

Please answer this section to describe if you have been in paid employment at any time during the last four weeks or you have done regular, organised voluntary work. If you answer 'No' you will move onto the recreation section.

Have you been in employment during the past 4 weeks?

Yes (2)

No (1)

If No Is Selected, then skip to end of block.

1. In the last 4 weeks, how many TOTAL hours of work did you do per week (excluding travel)?

Note: Please use decimal format (xx.xx) [e.g. 10.25 = 10 hours and 15 min and 2.5 = 2 hours and 30 min]

4 weeks ago (1)

3 weeks ago (2)

2 weeks ago (3)

1 week ago (4)

Type of work:

We would like to know the type and amount of physical activity involved in your work. 2. Please choose the option that BEST corresponds with your occupation(s) in the last 4 weeks from the following four possibilities:

Sedentary occupation: you spend most of your time sitting (such as in an office). (2)

Standing occupation: you spend most of your time standing or walking. However, your work does not require intense physical effort (e.g. shop assistant, hairdresser, guard). (2.5)

Manual work: this involves some physical effort including handling heavy objects and use of tools (e.g. plumber, electrician, carpenter). (3)

Heavy manual work: this implies very vigorous physical activity including handling very heavy objects (e.g. dock worker, miner, bricklayer, construction worker). (7.5)

3. What is the approximate distance from your home to your work in kilometres? (e.g. 10.5)

4. How many times a week did you travel from home to your main work? (Count outward journeys only).

5. How did you normally travel to work?

	Always (1)	Usually (.75)	Occasionally (.25)	Rarely or Never (0)
By car/motor vehicle (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
By works or public transport (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
By bicycle (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Walking (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

6. Please enter the postcode for your main place of work during the last 4 weeks. If you don't know your post code, please go to question 7, otherwise skip to question 8.

7. If you didn't know your work post code, please enter your work address.

8. What is the postcode of your home address?

SECTION C: RECREATION The following questions ask about how you spent your leisure time. Please indicate how often you did each activity on average over the last 4 weeks. Please indicate the average length of time that you spent doing the activity on each occasion.

1. Please indicate the NUMBER OF TIMES you did each activity in the past 4 weeks.E.g. if you did weeding for 1.5 hours twice a week, you would select '2 to 3 times per week' for the number of times. If you did an activity which doesn't fit into any of those listed below, please list them under the 'Other' options and state what they were.

	Number of times in last 4 weeks						
	None (0)	Once in the last 4 weeks (.03)	2 to 3 times in the last 4 weeks (.09)	Once a week (.14)	2 to 3 times a week (.36)	4 to 5 times a week (.64)	Every day (1)
Swimming competitively	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Swimming leisurely	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hiking or mountain climbing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Walking for pleasure (not as a means of transport)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Racing or rough terrain cycling	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Cycling for pleasure (not as a means of transport)	<input type="radio"/>						
Mowing the lawn	<input type="radio"/>						
Watering the lawn or garden	<input type="radio"/>						
Digging, shoveling or chopping wood	<input type="radio"/>						
Weeding or pruning	<input type="radio"/>						
DIY e.g. carpentry, home or car maintenance	<input type="radio"/>						
High impact aerobics or step aerobics	<input type="radio"/>						
Other types of aerobics	<input type="radio"/>						
Exercise with weights	<input type="radio"/>						
Conditioning exercises e.g. using an exercise bike or rowing machine	<input type="radio"/>						
Floor exercises e.g. stretching, bending, keep fit or yoga	<input type="radio"/>						
Dancing e.g. kapa haka, waiata-a-ringa, lakalaka, hip hop	<input type="radio"/>						
Competitive running	<input type="radio"/>						
Jogging	<input type="radio"/>						
Bowling - indoor, lawn or 10 pin	<input type="radio"/>						
Tennis or badminton	<input type="radio"/>						
Squash	<input type="radio"/>						
Table tennis	<input type="radio"/>						
Golf	<input type="radio"/>						

Football, rugby, hockey, touch	<input type="radio"/>						
Cricket or softball/baseball	<input type="radio"/>						
Rowing	<input type="radio"/>						
Netball, volleyball or basketball	<input type="radio"/>						
Fishing	<input type="radio"/>						
Horse-riding	<input type="radio"/>						
Snooker, billiards or darts	<input type="radio"/>						
Musical instrument playing or singing	<input type="radio"/>						
Ice skating	<input type="radio"/>						
Sailing, wind-surfing or boating	<input type="radio"/>						
Martial arts boxing or wrestling	<input type="radio"/>						
Other 1	<input type="radio"/>						
Other 2	<input type="radio"/>						
Other 3	<input type="radio"/>						
Other 4	<input type="radio"/>						
Other 5	<input type="radio"/>						

The following are activities you reported doing 'once in the last four weeks.'

The following are activities you reported doing '2-3 times in the last four weeks.'

The following are activities you reported doing 'once a week.'

The following are activities you reported doing '2-3 times a week.'

The following are activities you reported doing '4-5 times a week.'

Please indicate the AVERAGE LENGTH OF TIME you spent doing that activity on each of those occasions.

Note: We want to know the AVERAGE TIME you spent doing the activity on EACH OCCASION, not the total time per week, e.g. if you did weeding for 1.5 hours twice a week, you would select '1' for hours and '30' for minutes. The following are activities you reported doing 'every day.'

Hours								Minutes			
None (0)	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	More than 6 (7)	None (0)	15 (.25)	30 (.5)	45 (.75)
<input type="radio"/>											



## Appendix J: Pittsburgh Sleep Quality Index

INSTRUCTIONS: The following questions relate to your usual sleep habits during the past month only. Your answers should indicate the most accurate reply for the majority of days and nights in the past month. Please answer all questions.

1. During the past month, what time have you usually gone to bed at night?

- 1:00 AM (1)
- 1:30 AM (1.5)
- 2:00 AM (2)
- 2:30 AM (2.5)
- 3:00 AM (3)
- 3:30 AM (3.5)
- 4:00 AM (4)
- 4:30 AM (4.5)
- 5:00 AM (5)
- 5:30 AM (5.5)
- 6:00 AM (6)
- 6:30 AM (6.5)
- 7:00 AM (7)
- 7:30 AM (7.5)
- 8:00 AM (8)
- 8:30 AM (8.5)
- 9:00 AM (9)
- 9:30 AM (9.5)
- 10:00 AM (10)
- 10:30 AM (10.5)
- 11:00 AM (11)
- 11:30 AM (11.5)
- 12:00 PM (12)
- 12:30 PM (12.5)
- 13:00 (1:00 PM) (13)
- 13:30 (1:30 PM) (13.5)
- 14:00 (2:00 PM) (14)
- 14:30 (2:30 PM) (14.5)
- 15:00 (3:00 PM) (15)
- 15:30 (3:30 PM) (15.5)
- 16:00 (4:00 PM) (16)
- 16:30 (4:30 PM) (16.5)
- 17:00 (5:00 PM) (17)
- 17:30 (5:30 PM) (17.5)
- 18:00 (6:00 PM) (18)
- 18:30 (6:30 PM) (18.5)
- 19:00 (7:00 PM) (19)
- 19:30 (7:30 PM) (19.5)
- 20:00 (8:00 PM) (20)
- 20:30 (8:30 PM) (20.5)
- 21:00 (9:00 PM) (21)
- 21:30 (9:30 PM) (21.5)
- 22:00 (10:00 PM) (22)
- 22:30 (10:30 PM) (22.5)
- 23:00 (11:00 PM) (23)
- 23:30 (11:30 PM) (23.5)
- 24:00 (12:00 AM) (0)
- 24:30 (12:30 AM) (0.5)2.

During the past month, how long (in min) has it usually taken you to fall asleep each night?

- Less than 15 min (0)
- 15-30 min (1)
- 30-60 min (2)
- More than 60 min (3)

3. During the past month, what time have you usually gotten up in the morning?

- 1:00 AM (25)
- 1:30 AM (25.5)
- 2:00 AM (26)
- 2:30 AM (26.5)
- 3:00 AM (27)
- 3:30 AM (27.5)
- 4:00 AM (28)
- 4:30 AM (28.5)
- 5:00 AM (29)
- 5:30 AM (29.5)
- 6:00 AM (30)
- 6:30 AM (30.5)
- 7:00 AM (31)
- 7:30 AM (31.5)
- 8:00 AM (32)
- 8:30 AM (32.5)
- 9:00 AM (33)
- 9:30 AM (33.5)
- 10:00 AM (34)
- 10:30 AM (34.5)

- 11:00 AM (35)
- 11:30 AM (35.5)
- 12:00 PM (36)
- 12:30 PM (36.5)
- 13:00 (1:00 PM) (37)
- 13:30 (1:30 PM) (37.5)
- 14:00 (2:00 PM) (38)
- 14:30 (2:30 PM) (38.5)
- 15:00 (3:00 PM) (39)
- 15:30 (3:30 PM) (39.5)
- 16:00 (4:00 PM) (40)
- 16:30 (4:30 PM) (40.5)
- 17:00 (5:00 PM) (41)
- 17:30 (5:30 PM) (41.5)
- 24:30 (12:30 AM) (48.5)
- 18:00 (6:00 PM) (42)
- 18:30 (6:30 PM) (42.5)
- 19:00 (7:00 PM) (43)
- 19:30 (7:30 PM) (43.5)
- 20:00 (8:00 PM) (44)
- 20:30 (8:30 PM) (44.5)
- 21:00 (9:00 PM) (45)
- 21:30 (9:30 PM) (45.5)
- 22:00 (10:00 PM) (46)
- 22:30 (10:30 PM) (46.5)
- 23:00 (11:00 PM) (47)
- 23:30 (11:30 PM) (47.5)
- 24:00 (12:00 AM) (48)

4. During the past month, how many hours of actual sleep did you get at night? (This may be different than the number of hours you spent in bed). Please enter numbers only and round to the nearest half. Ex. input 6 for 6 hours or 6.5 for 6 hours and 30 minutes.

- Hours:

6. For each of the remaining questions, check the one best response. Please answer all questions.

5. During the past month, how often have you have trouble sleeping because you...

	Not during the past month (0)	Less than once a week (1)	Once or twice a week (2)	Three or more times a week (3)
a) Cannot get to sleep within 30 minutes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b) Wake up in the middle of the night or early morning	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c) Have to get up to use the bathroom	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d) Cannot breathe comfortably	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e) Cough or snore loudly	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f) Feel too cold	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
g) Feel too hot	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
h) Had bad dreams	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
i) Have pain	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
j) Other reasons (please use text box below)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

6. During the past month, how would you rate your sleep quality overall?

- Very good (0)
- Fairly good (1)
- Fairly bad (2)
- Very Bad (3)

7. During the past month, how often have you taken medicine to help you sleep (prescribed or 'over the counter')?

- Not during the past month (0)
- Less than once a week (1)
- Once or twice a week (2)
- Three or more times a week (3)

8. During the past month, how often have you had trouble staying awake while driving, eating meals, or engaging in social activity?

- Not during the past month (0)
- Less than once a week (1)
- Once or twice a week (2)
- Three or more times a week (3)

9. During the past month, how much of a problem has it been for you to keep up enough enthusiasm to get things done?

- No problem at all (0)
- Only a very slight problem (1)
- Somewhat of a problem (2)
- A very big problem (3)



## Appendix K: Brief Resilience Scale

Please select the choice that best describes you

	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)
1. I tend to bounce back quickly after hard times.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. I have a hard time making it through stressful events.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. It does not take me long to recover from a stressful event.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. It is hard for me to snap back when something bad happens.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. I usually come through difficult times with little trouble.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. I tend to take a long time to get over setbacks in my life.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Scoring: Statements 2, 4 and 6 are reverse coded. All items are averaged to produce a mean score from 1 (worst) to 5 (best).



## Appendix L: Flourishing Scale

Below are eight statements with which you may agree or disagree. Using the 1-7 scale below, indicate your agreement with each item by indicating that response for each statement.

	Strongly Disagree (1)	Disagree (2)	Slightly Disagree (3)	Neither Agree or Disagree (4)	Slightly Agree (5)	Agree (6)	Strongly Agree (7)
1. I lead a purposeful and meaningful life.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. My social relationships are supportive and rewarding.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. I am engaged and interested in my daily activities.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. I actively contribute to the happiness and well-being of others.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. I am competent and capable in the activities that are important to me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. I am a good person and live a good life.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. I am optimistic about my future.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. People respect me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Scoring: Add the responses varying from 1 to 7, for all eight items. The possible range of scores is from 8 (lowest possible) to 56 (highest PWB possible). A high score represents a person with many psychological resources and strengths.



## Appendix M: Subjective Happiness Scale

INSTRUCTIONS: The following questions refer to your general perceptions and feelings in the past four weeks. To help answer these questions, think of a significant event that occurred a month ago. Please select the answer which best represents how you have felt most days. There are no wrong or right answers. Do not spend too much time on any given statement.

1. In general, I consider myself:

- Not a very happy person 1
- 2
- 3
- 4
- 5
- 6
- A very happy person 7

2. Compared to most of my peers, I consider myself:

- Less happy 1
- 2
- 3
- 4
- 5
- 6
- More happy 7

3. Some people are generally very happy. They enjoy life regardless of what is going on, getting the most out of everything. To what extent does this characterization describe you?

- Not at all 1
- 2
- 3
- 4
- 5
- 6
- A great deal 7

4. Some people are generally not very happy. Although they are not depressed, they never seem as happy as they might be. To what extent does this characterization describe you?

- Not at all 1
- 2
- 3
- 4
- 5
- 6
- A great deal 7

## Appendix N: 21-Item Depression Anxiety and Stress Scales (DASS-21)

Please read each statement and select a number 0, 1, 2 or 3 which indicates how much the statement applied to you over the past four weeks. There are no right or wrong answers.

The rating scale is as follows: 0 Did not apply to me at all 1 Applied to me to some degree, or some of the time 2 Applied to me to a considerable degree, or a good part of time 3 Applied to me very much, or most of the time

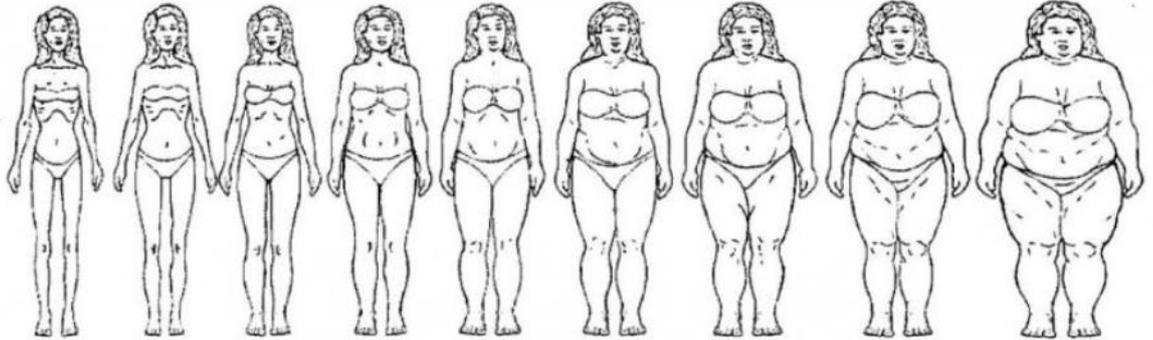
	0	1	2	3
1. I found it hard to wind down	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. I was aware of dryness of my mouth	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. I couldn't seem to experience any positive feeling at all	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. I experienced breathing difficulty (e.g. excessively rapid breathing, breathlessness in the absence of physical exertion)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. I found it difficult to work up the initiative to do things	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. I tended to over-react to situations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. I experienced trembling (e.g. in the hands)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. I felt that I was using a lot of nervous energy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. I was worried about situations in which I might panic and make a fool of myself	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. I felt I had nothing to look forward to	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11. I found myself getting agitated	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12. I found it difficult to relax	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13. I felt down-hearted and blue	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14. I was intolerant of anything that kept me from getting on with what I was doing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15. I felt I was close to panic	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16. I was unable to become enthusiastic about anything	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17. I felt I wasn't worth much as a person	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

18. I felt that I was rather touchy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
19. I was aware of the action of my heart in the absence of physical exertion (e.g. sense of heart rate increase, heart missing a beat)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
20. I felt scared without any good reason	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
21. I felt that life was meaningless	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Appendix O: Figure Rating Scale

Q7.1 Choose the figure which most accurately depicts....

*A*   *B*   *C*   *D*   *E*   *F*   *G*   *H*   *I*



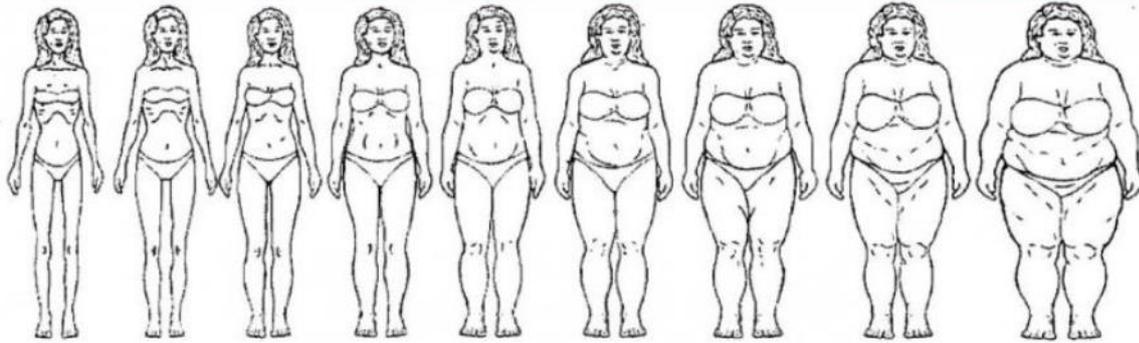
**1. How you think you currently look.**

- A (1)
- B (2)
- C (3)
- D (4)
- E (5)
- F (6)
- G (7)
- H (8)
- I (9)

---

Q7.3 Choose the figure which most accurately depicts....

*A*   *B*   *C*   *D*   *E*   *F*   *G*   *H*   *I*



**3. How you would like to look.**

- A (1)
- B (2)
- C (3)
- D (4)
- E (5)
- F (6)
- G (7)
- H (8)
- I (9)

## Appendix P: Next Level Health Questionnaire

### DEMOGRAPHIC INFORMATION

1. Are you in a relationship?

- Yes (1)
- No (2)
- Undefined (3)

2. Do you have children?

- Yes. If yes, how many? (1) \_\_\_\_\_
- No (2)

### PSYCHOLOGICAL EMPOWERMENT AND SELF-PERCEPTION

How much do you agree with the following statements?

	Strongly Disagree (1)	Disagree (2)	Neither Agree nor Disagree (3)	Agree (4)	Strongly Agree (5)
1. I feel in control of my own health	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. I know what I need to do to be healthy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. I am confident with my body	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. I am comfortable with my body	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## SOCIAL HEALTH

	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)
1. I have often felt lonely.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. I would say I have a good support network.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. I have quality friends I can seek support from when I need to.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. I can seek support from my family when I need to.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## HEALTH-PROMOTING BEHAVIOURS

The following questions will ask you about your unique lifestyle over the past FOUR WEEKS. Think about a significant event that happened one month ago to help you answer these questions. There are no right or wrong answers. Please try to choose answers which best match your own opinions and actions.

### *Physical Activity*

In the past four weeks, how often did you do...

	Not at all (0)	1-3 times a month (0.5)	1-2 days per week (1.5)	3-4 days per week (3.5)	5-6 days per week (5.5)	Every day (7)
1. Flexibility/stretching/balance activities (i.e. yoga, warm up/cool down stretching, etc.) for at least 10 minutes.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Muscle strengthening activities (i.e. weights, pushups, squats, core strengthening, etc.) for at least 10 minutes.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Sleep

In the past four weeks, how often did you...

	Not at all (0)	Less than once a week (0.5)	1-2 days a week (1.5)	3-4 days a week (3.5)	5-6 days a week (5.5)	Every day (7)
1. Go to bed near the same hour (e.g. between 10-11pm)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Wake up near the same hour (e.g. between 7-8am)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. Follow a sleep ritual before going to bed (e.g. drink tea, brush teeth, shower, read)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. Eat food in your bed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. Do work/study in your bed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. Take a nap longer than 30 minutes during the day.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. Consume caffeine (e.g. coffee, fizzy drinks, caffeinated tea, energy drinks, chocolate) within 5 hours of going to bed.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. Consume within 3 hours of going to bed.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. Consume sugary food/drinks within 2 hours before going to sleep	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. Ingest nicotine (e.g. smoked tobacco) within 5 hours before going to bed.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11. Consume a meal (larger than a small snack like a piece of fruit) within 2 hours of going to bed.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

In the past four weeks, how much time was spent not looking at an artificially/back lit screen (i.e. phone, lap top, T.V., tablet, backlit e-readers, etc.) before going to sleep on an average night.

- None i.e. going to sleep to T.V., Facebook, Youtube videos (0)
- Less than 30 min (.25)
- 30 min (0.5)
- 1 hour (1)
- 1.5 hours (1.5)
- 2 hours (2)
- More than two hours (e.g. reading a book more than two hours) (2.5)

#### *Nutrition*

In the past four weeks, on average, how many servings of fruit - fresh, frozen, canned or stewed - did you eat per day? Do not include fruit juice or dried fruit. A serving is the same as a medium piece of fruit such as an apple or two small pieces of fruit such as two apricots, or half a cup of stewed fruit.

- None, I don't eat vegetables (0)
- Less than one serving per day (0.5)
- 1 serving (1)
- 2 servings (2)
- 3 servings (3)
- 4 or more servings (4)
- Don't know (1)

In the past four weeks, on average, how many servings of fruit - fresh, frozen, canned or stewed - did you eat per day? Do not include fruit juice or dried fruit. A serving is the same as a

medium piece of fruit such as an apple or two small pieces of fruit such as two apricots, or half a cup of stewed fruit.

- None, I don't eat fruit (0)
- Less than one serving per day (0.5)
- 1 serving (1)
- 2 servings (2)
- 3 servings (3)
- 4 or more servings (4)
- Don't know (1)

In the past four weeks, what type of bread, rolls, or toast do you eat most of?

- None, I don't eat bread (0)
- White (0)
- High fibre white (1)
- Light grain bread (e.g. Molenberg, Freya's, Ploughmans, and MacKenzie High Country) (2)
- Heavy grain bread (e.g. Vogels and Burgen) (3)
- Other (1) \_\_\_\_\_

What type of fat or oil do you use most often when cooking?

- None (0)
- Butter (2)
- Margarine (1)
- Butter blend (2)
- Oil (1)
- Dripping or lard (3)
- Other (1) \_\_\_\_\_
- Don't know (1)

How often do you have a drink containing alcohol?

- I don't drink alcohol (0)
- Monthly or less (0.25)
- Up to 4 times per month (1)
- Up to 3 times a week (3)
- 4 or more times per week (4.5)

I add \_\_\_\_\_ to my food during cooking/at the table....

	Never (1)	Rarely (2)	Sometimes (3)	Often (4)	All of the Time (5)
Salt	<input type="radio"/>				
Soy sauce/Soy	<input type="radio"/>				

	Never (0)	Less than once per week (0.5)	1-2 times per week (1.5)	3-4 times per week (3.5)	5-6 times per week (5.5)	7 or more times per week (7)	Don't know (1)
1. Legumes and/or lentils (i.e. beans, peas, etc.).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Seafood - such as fish or shellfish (fresh, canned or frozen).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. Hot chips, french fries, wedges or kumara chips.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. Battered or fried fish or shellfish.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. Fast food or takeaways (think about breakfast, lunch, dinner and snacks - don't include times when you have only purchased a beverage).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. Fruit juices and drinks.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. Fizzy drinks.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. Energy drinks.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. Lollies, sweets, chocolate and confectionary.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. Pastries, baked items (i.e. pies, muffins, cakes, biscuits, etc.).	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

In the past four weeks, when you had the opportunity, how often did you...

	Never (0)	Rarely (1)	Sometimes (2)	Often (3)	All of the Time (4)	N/A (0)
1. Choose whole grain varieties (i.e. pasta, bread, wraps, etc.)	<input type="radio"/>					
2. Add seeds or nuts to you meals (i.e. salads, smoothies, pasta, stirfry, etc.).	<input type="radio"/>					

	Never (0)	Less than once per week (0.5)	1-2 days a week (1.5)	3-4 days a week (3.5)	5-6 days a week (5.5)	Everyday (7)	Don't know (1)
1. A source of calcium (i.e. milk, cheese, fortified cereal, fortified juice, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. A source of iron (i.e. red meat like lamb and beef steak, mussels, oysters, liver, kidney beans, soy beans, dark leafy greens, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

When looking at nutrition labels, I tend to look at...

	Never (1)	Rarely (2)	Sometimes (3)	Often (4)	All of the Time (5)
Sodium	<input type="radio"/>				
Sugar	<input type="radio"/>				
Fat	<input type="radio"/>				
Fibre	<input type="radio"/>				

### *Eating Behaviour*

In the past four weeks, how often did you eat breakfast?

- Never/Less than once a week (0.5)
- 1-2 days a week (1.5)
- 3-4 days a week (3.5)
- 5-6 days a week (5.5)
- Every day (7)

In the past four weeks, how often did you eat three meals (or equivalent e.g. by snacking)?

- Never/Less than once a week (0.5)
- 1-2 days a week (1.5)
- 3-4 days a week (3.5)
- 5-6 days a week (5.5)
- Every day (7)

In that past four weeks, how often did you prepare/cook...

	Never (0)	Less than once a week (0.5)	1-2 days a week (1.5)	2-3 days a week (2.5)	4-5 days a week (4.5)	6-7 days a week (6.5)
Breakfast	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lunch	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Dinner	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Snacks	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

In the past four weeks, how often did you buy prepared food, takeaways or eat out?

	Never (0)	Less than once a week (0.5)	1-2 days a week (1.5)	2-3 days a week (2.5)	4-5 days a week (4.5)	6-7 days a week (6.5)
Breakfast	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lunch	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Dinner	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Snacks	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

On an average week in the last month, how often did someone else prepare food for you (excluding eating out, takeaways or store bought) i.e. family members, flatmates, parents, etc.

	Never (0)	Less than once a week (0.5)	1-2 days a week (1.5)	2-3 days a week (2.5)	4-5 days a week (4.5)	6-7 days a week (6.5)
Breakfast	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lunch	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Dinner	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Snacks	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

In the past four weeks, how many meals did you plan ahead (e.g. shopping at the market)...

	Never (0)	Less than once a week (0.5)	1-2 days a week (1.5)	2-3 days a week (2.5)	4-5 days a week (4.5)	6-7 days a week (6.5)
Breakfast	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lunch	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Dinner	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Snacks	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

On an average day, how many glasses of water do you drink? 1 glass is about 250mL or 1/3 of a standard Pump water bottle.

- None (0)
- Less than 1 per day (1)
- 1-2 per day (2)
- 3-4 per day (3)
- 5-6 per day (4)
- 7-8 per day (5)
- 9-10 per day (6)
- More than 10 per day (7)

### *Self-care*

In the past four weeks, how much time did you spend on the following factors?

	Not enough at all (1)	A little, but needed more (2)	Enough (3)	A little more than needed (4)	Too much (5)
Personal goals/values (e.g.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Self-appreciation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Relaxation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Personal development/growth	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

### *Stress Management*

In the past four weeks, how much time did you spend on the following factors?

	Not enough at all (1)	A little, but needed more (2)	Enough (3)	A little more than needed (4)	Too much (5)
Self-reflection	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

How much do you agree that the following statement describes you?

	Strongly Disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly Agree (5)
I tend to seek support from others when needed.	<input type="radio"/>				

In the past four weeks, how often did you?

	Not at all (1)	Rarely (2)	Sometimes (3)	Most of the time (4)	All of the time (5)
Manage your time well.	<input type="radio"/>				

## **Appendix Q: Post-Intervention Evaluation Form**

# **Next Level Health**

## **Post-Intervention Evaluation Form**

### **OUTCOMES FROM NEXT LEVEL HEALTH**

- Did you experience any change(s) to your overall health that you attribute to your involvement in Next Level Health? Consider physical, mental, social and other aspects of health. Please provide details.
  
- Did you experience any change(s) to your ability for your health that you attribute to your involvement in Next Level Health? Consider your health practice, habits and perspective of health. Please provide details.
  
- If you answered “yes” to either of the above, what do you feel is maintainable beyond exiting the programme and why? Please provide details.

### **EXPERIENCE OF NEXT LEVEL HEALTH**

- What did you enjoy about Next Level Health and why?



Not helpful at all -----> Somewhat helpful -----> Very helpful

Physical Activity	1	2	3	4	5
Sleep	1	2	3	4	5
Nutrition	1	2	3	4	5
Eating Behaviour	1	2	3	4	5
Self-care	1	2	3	4	5
Stress Management	1	2	3	4	5

Comments:

**Please rate how helpful the following components were for your development in health throughout the programme.**

Not helpful at all -----> Somewhat helpful -----> Very helpful

Mentor (Victoria)	1	2	3	4	5
Monthly check-ins	1	2	3	4	5
Ability to choose small goals	1	2	3	4	5
Personal planning	1	2	3	4	5
Goal printouts	1	2	3	4	5
Weekly checklists	1	2	3	4	5
Monthly independence/ Practicing self-motivation	1	2	3	4	5
Focusing on multiple	1	2	3	4	5

health categories at a time

Reminder text messages	1	2	3	4	5
Mid-monthly support texts	1	2	3	4	5
Facebook group	1	2	3	4	5

**Please rate how helpful the following components were to ‘sticking with’ the programme for the past six months (adherence).**

Not helpful at all -----→ Somewhat helpful -----→

Very helpful

Mentor (Victoria)	1	2	3	4	5
Monthly check-ins	1	2	3	4	5
Weekly checklists	1	2	3	4	5
Goal printouts	1	2	3	4	5
Personal planning	1	2	3	4	5
Reminder text messages	1	2	3	4	5
Mid-monthly support texts	1	2	3	4	5
Facebook group	1	2	3	4	5

**\*\*\*Please provide any further comments on your experience in Next Level Health on the back of the last page\*\*\***





## Appendix S: BORG Scale of Perceived Exertion

<b>6</b>	<b>No exertion</b>
<b>7</b>	
<b>8</b>	
<b>9</b>	
<b>10</b>	
<b>11</b>	<b>Light</b>
<b>12</b>	
<b>13</b>	<b>Somewhat hard</b>
<b>14</b>	
<b>15</b>	<b>Hard (heavy)</b>
<b>16</b>	
<b>17</b>	<b>Very hard</b>
<b>18</b>	
<b>19</b>	
<b>20</b>	<b>Maximal exertion</b>



# Appendix T: Information Sheet



MASSEY UNIVERSITY  
COLLEGE OF HEALTH  
TE KURA HAUORA TANGATA

NEXT LEVEL HEALTH®!

A 24 WEEK INDIVIDUALISED HEALTH PROGRAM BASED ON SMALL ACHIEVABLE  
GOALS TO DEVELOP HEALTHY LIFESTYLE HABITS

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## INFORMATION SHEET

Thank you for showing an interest in this study. **This is a pilot study for a PhD research project aiming to develop a health program and does not qualify as a sanctioned program.** Please read everything below before deciding if you want to take part. This information sheet will tell you a little more about the study and what your involvement would be.

### WHAT IS THE PURPOSE OF THIS RESEARCH?

Many strategies employed to address weight loss and improve health through exercise and diet are relatively unsuccessful. A possible reason for the barrier to exercise and diet is a ‘one size fits all’ approach that does not consider the individual’s needs or the expectation to committing to a long term lifestyle change to achieve and maintain healthy body shape goals. This health program is unique as it addresses the individual’s personal barriers in the form of small achievable goals aiming to develop lasting health benefits and healthy lifestyle habits which optimize and maintain health and healthy body shape goals. This study also investigates the effect of an individualized health program at the level of gene expression specifically exploring potential epigenetic biomarkers for signalling metabolic pathways important for achieving and maintaining health. Consistent, unhealthy lifestyle choices lead to health deterioration and the possible development of serious chronic illnesses resulting in an overall poorer quality of life. This occurrence can largely be prevented by developing healthy habits, thus a healthier lifestyle. Establishing healthy habits is the most cost-effective and realistic way to achieve and maintain health long-term.

### WHO CAN TAKE PART IN THIS STUDY?

To take part in this study you should:

- Be a woman between 18 and 40 years of age upon start of the 6 month health program.
- Not be pregnant or breast feeding.
- Have had regular menstrual cycles for the past 12 months. Irregularity due to birth control is okay. Please inquire for further clarification.
- Not have any serious chronic diseases such as heart disease, diabetes or cancer.

**If you become pregnant, start menopause, or develop one of the above illnesses any time during the health program you will no longer be able to participate in the study.**

Your participation in this project is voluntary. If you do agree to participate, you can withdraw from participation at any time during the project without any adverse consequence. Any data collected or meeting recorded prior to withdrawal will be considered for analysis as any other data unless otherwise requested.

## WHAT IS INVOLVED IN TAKING PART IN THIS STUDY?

---

The duration of the program lasts a total of 24 weeks. An additional follow-up session will occur 24 weeks after completion of the program (week 48). The 'Next Level' program takes an integrated approach to provide health advice in key areas: diet, exercise, sleep and self-care which can be applied to individual circumstances. Each participant will focus on six areas of health for 24 weeks including physical activity, sleep, nutrition, eating behaviour, self-care and stress management. Participants will choose a small achievable goal from each 'health area' to focus on every four weeks. If a small goal is achieved over four weeks, the participant can then 'level up' to the next small achievable goal and is expected to maintain any previous goals. You will be asked to attend a check-in meeting every four weeks to determine whether you are ready to work toward the next level (a new small achievable goal) for each health area and accordingly assigned new goals. Three health assessments will occur in order to analyse the effect of the health program on behaviour change/maintenance, physical well-being, mental well-being and social well-being and gene expression. A follow-up assessment will occur 24 weeks after program exit. Apart from time, no cost will be required by anyone involved in the program. Support will consist of face-to-face meetings every month as new goals are assigned, previous goals reviewed and personal barriers will be addressed accordingly. Support will also be provided through a social media site. This space will provide participants access to health tips, motivation, as well as a space to connect and support each other to build a positive health community. Consent to partake in joining the social media site will be established by opting to join the private social media group.

### PROGRAM OUTLINE

**Visit 1: Health Assessment/Program start: Week 1**

**Visit 2: Check in: Week 5**

**Visit 3: Check in: Week 9**

**Visit 4: Check in: Week 13**

**Visit 5: Check in: Week 17**

**Visit 6: Check in: Week 21**

**Visit 7: Health Assessment/Program End: Week 24**

**Visit 8: Health Assessment/Follow-up: Week 48**

### NEXT LEVEL HEALTH® PROGRAM CONTENT – SMALL GOALS

These are just few examples to give you an idea of the program. Participants will have a choice of which goals to work on from each area of health.

#### NUTRITION

*Goals for nutrition will focus on content to achieve a balanced and varied diet unique to the participant's needs and lifestyle. Specific goals aim to increase vegetable intake and variety, limiting low-nutrient foods, ways to decrease sodium intake and small goals to enhance dietary fat composition. Other goals work on specific micronutrients important for women's health like calcium and iron.*

#### EATING BEHAVIOUR

*Goals for eating behaviour will focus on meal frequency, preparation, planning and hydration. Specific goals include meal planning during the week, healthy choices when eating out, increasing water consumption and enhancing ability to cook and prepare meals.*

#### EXERCISE

*Goals for exercise will focus on finding ways to incorporate and increase physical activity into your daily lifestyle as well as exploring new ways to be physically active and building personal goals. Small goals include developing consistent practice in areas of flexibility/balance, muscle strengthening and aerobic activity (cardio) as well as finding enjoyment in physical activity.*

#### SLEEP

*Goals for sleep will focus on avoiding behaviours which disturb sleep quality and duration. Small goals aim to help participants relax and wind down before going to bed, finding ways to prioritise sleep and identify behaviours which 'steal' quality sleep.*

#### SELF-CARE

*Goals for self-care will focus on small adjustments which can be made in the daily lifestyle to make time for one's self, explore new hobbies, personal growth and time management to save time and to reduce stress.*

#### STRESS MANAGEMENT

*Goals for stress management will help participants identify areas of stress in their life work toward reducing and/or managing these sources of stress.*

### **MONTHLY CHECK-INS**

You will be asked to meet with the head researcher for 1 hour once every four weeks to determine progress, establish new goals and discuss any personal barriers. This is meant as a time for direct support, motivation and to serve as an informational session. Monthly check-ins will typically take place at Massey campus. These meetings will be voice recorded upon consent to better understand the challenges and successes you face and the effectiveness of the program as you progress through Next Level Health®. Only the lead researcher who conducts the meetings will have access to these recordings.

### **SOCIAL MEDIA**

Indirect support will be available via a private social media group. This will provide details and information on small goals, health tips, motivation, reminders and access to a supportive community.

### **HEALTH ASSESSMENTS**

You will be asked to report to Massey University for a full health assessment on three occasions: at the start of the program (week 1), at the end of the program (week 24) and for a follow-up assessment (week 48). Testing sessions will last approximately 4 hours.

#### PHYSICAL WELLBEING

##### *Body Composition*

- Height, weight, and a series of skinfolds and girths will be measured. Skinfold measures will require a bit of tissue be pinched at the arm, shoulder, waist and leg. Girths will be measured at the waist, hips, arm, and leg, using a tape measure.

- An ultrasound probe will be placed above your navel and just below your rib cage to measure type of body fat under your skin and around your organs. The ultrasound device poses no known risk.
- Bioelectrical impedance analysis (BIA) will be used to measure body water, fat-free body mass and body fat percentage. BIA estimates these values by measuring the opposition of flow of a small electric current through body tissues which cannot be felt and poses no known risk. These devices are commonly used at gyms and fitness centres in weight scales.

#### *Fitness*

- A step test will be used to assess your aerobic fitness level. You will have to step up and down on a stool for 3.5 minutes at a set rhythm.
- Your blood pressure and heart rate will be measured and monitored.
- You will be asked to wear a fitness tracker on your wrist for the duration of the program to monitor activity and sleep. The fitness bands are fitted with accelerometers which can detect range and frequency of movement. This will provide information of increase or decrease of activity during the program. You will have access to your personal activity data and the option to keep your fitness band upon completion of the program.

#### *Metabolic*

- A glucose test strip and lipid test strip will be administered using blood collected from a finger prick.

#### *Epigenetic changes*

- To identify the impact of the program at the epigenetic level, blood will be taken. The head researcher, certified in phlebotomy practice, will collect two 4 mL tubes of blood. The same protocol is used as procedures used at the hospital for standard testing. The concept of epigenetics refers to gene expression states that are established in the absence of a change in the DNA sequence itself. This helps us to understand how our environment in the broad sense, including exercise, nutrition, toxins and even behaviour, contribute to the regulation of gene expression and hence to our resulting physical composition. This project specifically will look at changes in gene expression regarding metabolic pathways. Individual epigenetic information will not be disclosed, however, participants will be provided the summary of the study upon completion of the study which will not be able to identify any individual information. The entire epigenome will be assessed looking for changes in gene expression due to the health program thus, data from the entire epigenome will be maintained and analysed until completion of the research and then destroyed (as well as any remaining blood samples) following standard procedures. Specific cultural requests for human material disposal are welcome.

#### MENTAL WELLBEING AND SOCIAL WELLBEING

- You will need to complete a series of questionnaires to assess aspects of your mental well-being, social well-being and other lifestyle factors. You will be asked questions about your current opinions and practice regarding health, as well as specific questions concerning diet, physical activity, sleep patterns, and how you feel about your body.

#### WHAT WILL HAPPEN WITH THIS INFORMATION?

---

All of the information that the researchers collect will be kept on a secure computer. Participant's details and results will remain confidential, and their names will not be used at any time during the study. Only the head researcher will have access to the data. We may use the data that we

collect in publications or during presentations, but no one will be able to tell which data is yours. At the end of the project, a summary of findings can be sent at your request.

## WHAT IS THE NEXT STEP?

---

If you have any questions, you can ask any member of the research team at any time (listed below).

If you have read and understood everything that we will ask you to do and you would like to take part, please sign the 'Consent Form' which will be provided. Please contact Victoria Chinn to arrange a time to meet.

## PARTICIPANT'S RIGHTS

---

*You are under no obligation to accept this invitation. If you decide to participate, you have the right to:*

- *Decline to answer any particular question;*
- *Withdraw from the study at any time;*
- *Ask any questions about the study at any time during participation;*
- *Provide information on the understanding that your name will not be used unless you give permission to the researcher;*
- *Be given access to a summary of the project findings when it is concluded.*
- *Request a summary of an individual report at the conclusion of the study*

## PROJECT CONTACTS

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Victoria Chinn (Lead Researcher and PhD student)  
Dr. Michelle Thunders (Supervisor)  
[M.Thunders@massey.ac.nz](mailto:M.Thunders@massey.ac.nz)

Email: [V.Chinn@massey.ac.nz](mailto:V.Chinn@massey.ac.nz)  
Email:

## ETHICS APPROVAL STATEMENT

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*This project has been reviewed and approved by the Massey University Human Ethics Committee: Southern A, Application 14/90. If you have any concerns about the conduct of this research, please contact Dr Brian Finch, Chair, Massey University Human Ethics Committee: Southern A, telephone 06 350 5799 x 84459, email [humanethicsoutha@massey.ac.nz](mailto:humanethicsoutha@massey.ac.nz).*

## COMPENSATION FOR INJURY

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If physical injury results from your participation in this study, you should visit a treatment provider to make a claim to ACC as soon as possible. ACC cover and entitlements are not automatic and your claim will be assessed by ACC in accordance with the **Accident Compensation Act 2001**. If your claim is accepted, ACC must inform you of your entitlements, and must help you access those entitlements. Entitlements may include, but not be limited to, treatment costs, travel costs for rehabilitation, loss of earnings, and/or lump sum for permanent impairment. Compensation for mental trauma may also be included, but only if this is incurred as a result of physical injury. If your ACC claim is not accepted you should immediately contact the researcher. The researcher will initiate processes to ensure you receive compensation equivalent to that to which you would have been entitled had ACC accepted your claim.

*For professional support, please contact:*

*Massey Health and Counselling Services 04-801-2542 (Only applicable for Massey students)*

*OR*

*Healthline 0800-611-116 OR*

*Visit [sparx.org.nz](http://sparx.org.nz)*



# Appendix U: Participant Consent Form



MASSEY UNIVERSITY  
COLLEGE OF HEALTH  
TE KURA HAUORA TANGATA

## NEXT LEVEL HEALTH!

*A 24-Week Individualised Health Program Based on Small Achievable Goals to  
Develop Healthy Lifestyle Habits*

### PARTICIPANT CONSENT FORM - INDIVIDUAL

**This consent form will be held for a period of five (5) years**

- I have read the Information Sheet and have had the details of the study explained to me.
- My questions have been answered to my satisfaction, and I understand that I may ask further questions at any time or withdraw from the study at any time.
- I agree to participate in this study under the conditions set out in the Information Sheet.

**Signature:** .....

**Date:** .....

**Full Name - printed** .....



## Appendix V: Screening Form



MASSEY UNIVERSITY  
COLLEGE OF HEALTH  
TE KURA HAUORA TANGATA

### ***NEXT LEVEL HEALTH!***

*A 24 Week Individualised Health Program Based on Small Achievable Goals to Develop Healthy Lifestyle Habits*

### *Screening Form*

Participant Name: \_\_\_\_\_ Age \_\_\_\_\_ DOB: \_\_\_\_\_

Contact phone: \_\_\_\_\_ Email: \_\_\_\_\_

Address: \_\_\_\_\_ Postcode: \_\_\_\_\_

**Which of the following ethnic groups do you identify with? (Mark all that apply).**

- New Zealand European
- Māori
- Samoan
- Cook Island Maori
- Tongan
- Niuean
- Chinese
- Indian
- Other \_\_\_\_\_

**Do you have any of the following chronic illnesses? (If so, please mark whichever apply)**

- Heart disease
- Diabetes
- Cancer

**Are you pregnant or breastfeeding?**

- Yes
- No

**When was the start of your last menstrual cycle?** \_\_\_\_\_

**Have you had regular menstrual cycles for the past 12 months?**

- Yes
- No

If no, please provide details: \_\_\_\_\_

**Are you currently using hormonal contraceptives?**

Yes             No

○ If yes, what form: \_\_\_\_\_

**Do you have any of the following health conditions? (If so, please mark whichever apply)**

Asthma

Anaemia

Skin allergies/conditions

Thyroid disease

PCOS (Polycystic Ovary Syndrome)

Other condition (please specify): \_\_\_\_\_

**Are you on any other medications? If yes, what are these for? (Please include Names):**

\_\_\_\_\_  
—

**Are you taking any additional or dietary supplements? If yes, what are these for? (Please include names):**

\_\_\_\_\_  
—

**Have you recently (within the last 6 months) had any injuries which will affect taking the required measurements (i.e. fracture, sprain, strain)?**

Yes             No

○ If \_\_\_\_\_ yes, \_\_\_\_\_ please \_\_\_\_\_ provide \_\_\_\_\_ details:

\_\_\_\_\_

**Thank you for completing this form**

**Please return to:**

**Victoria Chinn**

**PhD Student**

**Institute of Food, Nutrition and Human Health**

**Massey University**

## Appendix W: Human Ethics Application

# Human Ethics Application

FOR APPROVAL OF PROPOSED RESEARCH/TEACHING/EVALUATION

INVOLVING HUMAN PARTICIPANTS

(All applications are to be typed and presented using language that is free from jargon and comprehensible to lay people)

---

### SECTION A

- 
- 1 Project Title** NEXT LEVEL! A 24 week individualised health program based on small achievable goals to develop healthy lifestyle habits.

**Projected start**

**date for data**

February 2014

February 2016

**collection**

**Projected end date**

.....  
(In no case will approval be given if recruitment and/or data collection has already begun).

- 
- 2 Applicant Details** (Select the appropriate box and complete details)

**ACADEMIC STAFF APPLICATION (excluding staff who are also students)**

**Full Name of Staff**

**Applicant/s**

**School/Department/Institute**

**Campus (mark one only)**

Albany

Palmerston  
North

Wellington

**Telephone** .....  
**Email**  
**Address**

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**STUDENT APPLICATION**

**Full Name of Student**  
**Applicant** Victoria Chinn

**Employer** (if applicable) Massey University

**Telephone** 0224049598  
**Email** [v.chinn@massey.ac.nz](mailto:v.chinn@massey.ac.nz)  
**Address**

**Postal Address** 48/120 Rintoul St Newtown Wellington 6021

**Full Name of Supervisor(s)** Dr Michelle Thunders, Dr Sarah Shultz, A/Prof Rachel Page, A/Prof  
Jane Coad (Palmerston North), A/Prof Rozanne Kruger (Albany)

**School/Department/Institute** College of Health IFNHH

**Campus** (mark one only)  
**Albany**  **Palmerston**   
**North**  **Wellington**

**Telephone** x63461  
**Email** m.thunders@massey.ac.nz  
**Address**

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**GENERAL STAFF APPLICATION**

Full Name of

Applicant

**Section**

**Campus** (mark one only)  
**Albany**  **Palmerston**   
**North**  **Wellington**

**Telephone** .....  
**Email Address**

**Full Name of Line Manager**

**Section**

**Telephone**

**Email**

**Address**

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**3 Type of Project** *(provide detail as appropriate)*

**Staff  
Research/Evaluation:**

**Student Research:**

**If other, please  
specify:**

**Academic Staff**

**Specify Qualification**

**General Staff**

**Specify Credit Value of  
Research**

**Evaluation**

**(e.g. 30, 60, 90, 120, 240,  
360)**

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**4 Summary of Project**

**Please outline in no more than 200 words in lay language why you have chosen this project, what you intend to do and the methods you will use.**

*(Note: All the information provided in the application is potentially available if a request is made under the Official Information Act. In the event that a request is made, the University, in the first instance, would endeavour to satisfy that request by providing this summary. Please ensure that the language used is comprehensible to all.)*

Many strategies employed to address weight loss and improve health through diet and exercise are relatively unsuccessful. A possible reason for the barrier to exercise and diet is a ‘one size fits all’ approach that does not consider the individual’s needs or the expectation to committing to a long term lifestyle change to achieve and maintain healthy body shape goals. This program is unique as it addresses the individual’s personal barriers in the form of small achievable goals to develop long-lasting, healthy lifestyle habits. Three health assessments will be taken at week 1 (baseline), week 24 (end of program) and week 48 (follow up) to determine if habits and health benefits have been made and independently maintained. Each assessment will include measurements of body composition, body satisfaction, lifestyle behaviours and blood collection to identify epigenetic biomarkers specifically associated with metabolic pathways. Every four weeks the

participant will attend a check-in meeting where small achievable goals will be assigned for each lifestyle topic dependent on their level. The 'next level questionnaire' customised and scored to the health program will determine which level the participant is ranked in several key lifestyle topics: diet, exercise, sleep, and time management/stress. The participant's aim will be to accomplish the assigned small goals for the following month in order to achieve the next level. Higher levels will build on small goals from previous levels thus incrementally developing habits by maintaining and advancing the same behaviour. . Direct support will be provided during monthly check-in as new goals are introduced. Contact and indirect support will be maintained through a private social media site. Contact information for professional support will be provided on the information sheet as well as on the social media site.

- 
- 5 List the Attachments to your Application**, e.g. Completed "Screening Questionnaire to Determine the Approval Procedure" (compulsory), Information Sheet/s (*indicate how many*), Translated copies of Information Sheet/s, Consent Form/s (*indicate of how many*), Translated copies of Consent Form/s, Transcriber Confidentiality Agreement, Confidentiality Agreement (*for persons other than the researcher / participants who have access to project data*), Authority for Release of Tape Transcripts, Advertisement, Health Checklist, Questionnaire, Interview Schedule, Evidence of Consultation, Letter requesting access to an institution, Letter requesting approval for use of database, Other (*please specify*).

Information Sheet (1)

Screening Questionnaire and Health Form (1) (This has the SF-36 questionnaire included on it)

Consent Form (1)

Recruitment Ad (1)

Release of Tape Transcripts (1)

Questionnaires

Recent Physical Activity Questionnaire (RPAQ) (1)

Pittsburgh Sleep Quality Index (PSQI) (1)

Social Well-Being Questionnaire (1)

Mental Well-Being Questionnaire (1) (,

Next Level Questionnaire (1)

Applications that are incomplete or lacking the appropriate signatures will not be processed. This will mean delays for the project.

Please refer to the Human Ethics website ( <http://humanethics.massey.ac.nz> ) for details of where to submit your application and the number of copies required.

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**SECTION B: PROJECT INFORMATION**

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## General

- 6 I/We wish the protocol to be heard in a closed meeting (Part II). Yes  No

*(If yes, state the reason in a covering letter.)*

- 7 Does this project have any links to previously submitted MUHEC or HDEC application(s)? Yes  No

**If yes, list the MUHEC or HDEC application number/s (if assigned) and relationship/s.**

Arm of Defining a Healthy Woman 1401

- 8 Is approval from other Ethics Committees being sought for the project? Yes  No

**If yes, list the other Ethics Committees.**

- 9 For staff research, is the applicant the only researcher? Yes  No

**If no, list the names and addresses of all members of the research team.**

Dr Michelle Thunders, Dr Sarah Shultz, A/Prof Rachel Page, A/Prof Rozanne Kruger, A/Prof Jane Coad, PG Stephanie McPhail

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Project Details

- 10 **State concisely the aims of the project.**

1) Measure the success of a health education intervention utilizing small achievable goals (short-term and long-term success 24 weeks post-intervention). Success would be defined as maintaining any health benefits changes in body composition, self-perception, lifestyle behaviours, healthy habits developed in the intervention as well as maintaining and increasing 'levels'.

2) Explore the influence of social media as a tool for adherence to a 24 week program.

3) Obtain a greater understanding of the impact of environmental exposure in terms of lifestyle choices on gene expression. Specifically looking at short-term and long-term changes in gene expression related to metabolic pathways to identify new potential biomarkers.

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**11 Give a brief background to the project to place it in perspective and to allow the project's significance to be assessed. (No more than 200 words in lay language)**

Many strategies employed to address weight loss and improve health through diet and exercise are relatively unsuccessful. A possible reason for the barrier to exercise and diet is a 'one size fits all' approach that does not consider the individual's need or the expectation to committing to a long term lifestyle change to achieve and maintain healthy body shape goals. This study is at the cutting edge of gene-environment interaction and population health research and would add unique data to the knowledge base for interventional healthcare specifically targeting and promoting the health of New Zealand women. It has the potential for being successful where other strategies have failed as the goal is to empower women to be active in achieving healthy body goals through understanding how lifestyle impacts on the molecular functioning of the body so they can make sustainable lifelong decisions concerning their health. There is an abundance of research investigating obesity-related disease. This study moves beyond traditional exploration to understand the epigenetic impact of 24 week diet and exercise integrated lifestyle intervention that is focused on achieving and maintaining health and healthy body goals rather than weight loss and uses social media technology as a motivational tool for adherence to the intervention.

---

**12 Outline the research procedures to be used, including approach/procedures for collecting data. Use a flow chart if necessary.**

*Assessment sessions (Start of program, end of program and 24 weeks post-program)*

Body composition: Using an international (ISAK) protocol, 24 variables including stature, body mass, skinfolds, and circumferences will be measured. From the measurements, sum of skinfolds, body mass index (BMI), abdominal-to-height ratio (AHtR), and height-to-weight ratio ( $HWR = \text{Stature} / \sqrt{3 \times \text{mass}}$ ) will be calculated. Somatotype (endomorph, mesomorph, ectomorph) ratings will be calculated using a combination of skinfold (Triceps, biceps, Subscapular, Supraspinale, iliac, abdominal, thigh and calf), circumferences (upper arm, calf), bone breadths (humerus, femur), and HWR. This protocol is preferred as it would translate easily to available clinical measures. Percentage of total body fat will be assessed using bioelectrical impedance analysis. Visceral adipose tissue (VAT) will be measured non-invasively by a portable, high-resolution, B-mode ultrasound device. Ultrasound measurements strongly agree with those of computed tomography and magnetic resonance imaging, but provide less participant burden.

Fitness Test: Queens step test (3 min steps at 22 steps/min rate) while heart rate and blood pressure are monitored.

Fitness Bands: Fitness bands are fitted with accelerometers and will be used to track movement of the each participant during the 6 month program. This will provide information of whether or not there is a change (increase/decrease) in activity during the program. Participants will have access to their own activity data upon completion of the program as to control any influence this knowledge would have during the program.

Questionnaires:

Recent Physical Activity Questionnaire (RPAQ), Mental Well-Being questionnaire (compilation of Body satisfaction scale, pulvers scale, Flourishing scale, Subjective happiness scale, Brief resilience scale, Depression anxiety and stress scale, and additional questions on confidence and body perception), Social well-being questionnaire (compilation of questions on support seeking tendencies, values, external health influence, and media consumption) The Next Level Health Questionnaire will include the, New Zealand Adult Nutrition Survey (NZANS as well as additional questions directly related to goals in the health program), Pittsburgh Sleep Quality Index (PSQI), Next Level Questionnaire. Questionnaires will be developed in an electronic format using Qualtrics (survey software) and distributed and completed during the session.

Epigenetic Analysis:

4 mL of blood will be collected using EDTA collection tubes. Blood will be collected at each health assessment upon consent. RNA will be extracted, purified and stabilised from peripheral blood at Massey and. Epigenetic analysis will be carried out by exploring changes in gene methylation status. Methylation status will be compared pre and post health program using reduced representation bisulfite sequencing (RRBS) for comparative high resolution DNA methylation analysis. This will be carried out by New Zealand Genomics Limited (NZGL) which

is a purchased service. This will allow us to obtain an overall picture of genomic methylation and how lifestyle changes effects gene regulation; looking for changes in gene expression, specifically of genes involved in metabolic pathways important for achieving and maintaining health.. Study findings have the potential to identify epigenetic biomarkers to help motivate women to maintain healthy body goals. Individual epigenetic information will not be disclosed, however, participants will be provided the summary of the study upon completion which will not identify any individual information. The entire epigenome will be assessed looking for changes in gene expression pre, end, and 24 weeks-post health program. Thus, data from the entire epigenome will be maintained and analysed until completion of the study and then destroyed following standard procedures.

Metabolic Analysis:

Fasting glucose and a lipid profile (total cholesterol, triglycerides, HDL, LDL) will be measured with test strips (2 total) using blood sourced from a finger prick. Intervention Outline:

Visit 1: Health Assessment/Program start: Week 1

Visit 2: Check in: Week 5

Visit 3: Check in: Week 9

Visit 4: Check in: Week 13

Visit 5: Check in: Week 17

Visit 6: Check in: Week 21

Visit 7: Health Assessment/Program End: Week 24

Visit 8: Health Assessment/Follow-up: Week 48

---

---

### Monthly Visits (Week 1, 5, 9, 16, 17, 21, 24)

During monthly check-ins when women are selecting new goals as well as reviewing passed goals, sessions will be audio recorded for qualitative analysis. These meetings will be audio recorded to further analyse the participant's experience in the program. Recording these sessions will provide a wealth of knowledge on the strengths and limitations of this program and capture the barriers, challenges and successes the women experience as they progress through the program. This could provide insight for further development of Next Level Health as well as useful information for other health programs and research focused in prevention and behaviour change. The lead researcher will transcribe the interviews which will be provided to participants for editing. Consent will be sought before any work using these transcriptions is published. Interview transcripts and audio recordings will be deleted upon completion of this PhD project.

Below an example of low and high levels and associated small goals for the Health Program have been outlined below to provide a better scope of the project:

#### **Diet**

##### Level 1

A person ranked as a level 1 would only prepare meals 1-2 times/wk, eat breakfast/lunch/dinner 1-2 times/wk, eat very few vegetables, have a high sugar intake, frequently buy and consume takeaway meals, have a diet characterised of low variation, less than a glass of water a day

Examples of small goals to achieve next level (level 2): Eat breakfast/lunch/dinner 3 times/wk, double their vegetable intake for the week, eat no more than 6 takeaway meals a week, drink a glass of water when you wake up.

##### Level 10

A person ranked as a level 10 would prepare meals every day, eat breakfast/lunch/dinner every day, have a high vegetable intake, have a low sugar intake, and rarely/never buy or consume takeaway meals, drink at least 8 glasses of water every day.

Small goals from all previous levels will continue to be assigned (since they are being met according to ranked level) and additional small goals will still be available even when ranked at a 10 to have something to work toward

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i.e. Prepare a new vegetable or prepare a vegetable in a new way,

## **Exercise**

### Level 1

Sedentary occupation, sedentary lifestyle at home, no extra physical activity outside of normal routine,

Small goals: always take the stairs, walk to nearby regular destination (work, friend's house, grocery store nearby), go for a walk during lunch 1-2 times/wk

### Level 10

30 or more min of moderate exercise every day (run 5k, swim, bike, row, team sport),

Small goals: Try new physical activity (yoga, rock climbing, surfing) and do 1/wk for a month

## **Sleep**

### Level 1

4 hours of sleep or less five or more times per week, always feels exhausted and worn out.

Small goals: Don't look at screen before sleeping twice a week, don't drink caffeine after 12pm 2 or more times per week

### Level 10

7-8 hours of sleep every night, always feels relatively well rested and energized

Additional small goals: Relaxing yoga stretches before sleeping, Read before sleeping

13

## **Time management/Stress**

### Level 1

5 hours of sleep or less five or more times per week, 4 hours of sleep 1 or more times per week, always feels tired, exhausted and/or stressed, 5 or more hours in front of screen (phone, TV, computer) outside 'work' hours, pressing deadlines

---

Small goals: set out clothes night before 1-2 times per week, make lunch night before 1-2 times per week or more

Level 5

Feels energetic or calm most of the time, 7-8 hours of sleep every night, deadlines not a constant issue

**Where will the project be conducted? Include information about the physical location/setting.**

Massey University – Wellington campus and the greater Wellington region

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**14 If the study is based overseas:**

**i) Specify which countries are involved;**

**ii) Outline how overseas country requirements (if any) have been complied with;**

**iii) Have the University's Policy & Procedures for Course Related Student Travel Overseas been met?**

*(Note: Overseas travel undertaken by students – refer to item 5.10 in the document "Additional Information" on the MUHEC website.)*

---

**15 Describe the experience of the researcher and/or supervisor to undertake this type of project?**

#### VChinn

Primary researcher for conducting data collection for sister project, 'Defining a Healthy Woman'. Has recruited and collected data from over 40 participants thus far. This protocol is very similar to the three health assessments with a similar protocol and set of measurements (Body composition measurements, Questionnaires, etc.). Familiar with survey development and distribution using Qualtrics software. ISAK certified level 1 for anthropometric measurements. Trained in measurement and analysis of visceral adipose tissue using B-Mode ultrasound. Experience gained via 'Defining a Healthy Woman' study as well as a reliability study for measuring visceral adipose tissue with B-mode Ultrasound. Received highest possible phlebotomy certification possible (6 supervised successful blood draws in front of head tech/phlebotomist at Wellington hospital). Also certified in comprehensive first aid. Will attend human ethics staff seminar on Nov. 13<sup>th</sup>. Familiar with use of social media and using private groups for security.

#### MThunders

PhD Human Genetics, experienced researcher for over 10 years looking at genotype-phenotype analysis, genetic profiles and high throughput polymorphism analysis. Lecturer in Health Sciences. Laptop and software (Tuxedo suite of Unix based freeware for differential gene expression analysis). Competent in differential expression analysis sheep embryo constraint data, juvenile and mature earthworm differential gene expression analysis. DNA and RNA extraction, PCR-RFLP genotyping. Two papers on differential gene expression analysis in preparation (sheep and earthworm data). Familiar with social media such as twitter and developing basic phone apps.

#### JCoad

Lecturer at the Institute of Food, Nutrition and Human Health, Massey University, Palmerston North. Responsible for teaching nutrition focusing on adult health, disease and micro-nutrients. Has supervised several PhD students to completion with nutrition-focused thesis.

#### RKruger

Senior lecturer at the Institute of Food, Nutrition and Human Health, Massey University, Auckland, and is responsible for teaching Human Nutrition and Dietetics including normal and therapeutic nutrition. Her research is focused on body composition profiling and obesity prevention relating to

---

food and nutrition issues in New Zealand populations and she and A/Prof Stonehouse successfully completed the pilot study investigating body composition profiles in a normal healthy free-living population of NZ European women (N=116; 18-45 years); 21.4% (n=25) were classified as NWO. Over the years she has gained valuable experience in conducting human intervention trials, and she is also a qualified body composition operator (BodPod), DXA technician, and an ISAK level 1 anthropometrist. She is conducting the EXPLORE study which is of similar topic who will both be good resources for nutrition advice.

SShultz

Lecturer in School of Sport and Exercise at Massey University, Wellington. She is the PI for the 'Defining a Healthy Woman' study. Maintains athletic training certification and her expertise and interests lie in childhood obesity in relation to biomechanics. Will be very helpful in providing information and support on fitness testing and physical activity arm of health program.

RPage

Lecturer of physiology, medical and health sciences, gene expression and more. Has completed supervision of several PhD students who have been involved in a number of intervention/clinical trials– WEST headache trial; SPIRIT study and RICE study, involving exercise, diet, education, and alternative treatment strategies for interventions. Here expertise includes the discovery of genes and respective gene products in diseased and non-diseased states; mRNA differential display; analysis of mRNA and protein expression; isolation and purification of mRNA, DNA and proteins; development and optimisation of molecular and biochemical techniques; metabolic control analysis; purification and characterisation of nucleic acids, proteins and lipids and measurement of metabolites in blood, urine and tissue samples.

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**16 Describe the process that has been used to discuss and analyse the ethical issues present in this project.**

Weekly supervisor meetings were held throughout the development of this application with discussion touching on all sections. Previous submission of application to ethics committee for continued conversation and advice. I've attended the Human Ethics seminar on Nov 13<sup>th</sup>.

---

**17 Describe the intended participants.**

One hundred women (18-40y) living in New Zealand of varying ethnicities will be recruited from the 'Defining a Healthy Woman' pool who have previously consented to be contacted about a health program. Thus from university campuses, local iwi, community health providers, and community centres

---

**18 How many participants will be involved?**

One hundred women (18-40y) will participate in this pilot study.

---

**What is the reason for selecting this number?**

*(Where relevant, attach a copy of the Statistical Justification to the application form)*

Given the constraints of time and budget, N=100 is a realistic goal to achieve for participants to adhere to the entire program and produce meaningful results. T. Ronn and his team conducted a comparable study which has shown this to be an effective number under similar constraints.

---

**19 Describe how potential participants will be identified and recruited?**

Potential participants will be recruited from the sister project 'Defining a Health Woman', recruitment posters placed around Wellington central as well as via social media.

---

**20 Does the project involve recruitment through advertising?** Yes  No

*(If yes, attach a copy of the advertisement to the application form)*

---

**21 Does the project require permission of an organisation (e.g. an educational institution, an academic unit of Massey University or a business) to access participants or information?** Yes  No

- If yes:**
- i) list the organisation(s)**
  - ii) attach a copy of the draft request letter(s) to the application form, e.g. letter to Board of Trustees, PVC, HoD/I/S, CEO etc (include this in your list of attachments (Q5).**

*(Note that some educational institutions may require the researcher to submit a Police Security Clearance.)*

**22 Who will make the initial approach to potential participants?**

PI Victoria Chinn and Dr Michelle Thunders

**23 Describe criteria (if used) to select participants from the pool of potential participants.**

Inclusion criteria will be age ( $\geq 18$  and  $\leq 40$  years) and post-menarche (as defined by at least one complete year of regular menstrual cycle present) and pre-menopausal. Exclusion criteria include pregnancy, lactation, menopause, and presence of any serious chronic illness (i.e. cancer, diabetes, cardiovascular disease, etc.) If participant becomes pregnant, menopausal or develops any serious chronic illness during the health program they will have to discontinue the study. This will be disclosed on the information sheet.

**24 How much time will participants have to give to the project?**

The health program will last 24 weeks. Through the duration of the program, a 30 minute consultation meeting will be held (between the participant and me, Victoria) every three weeks at the start of a new health topic throughout the 24 week program. In addition, three separate 2.5 hour assessment sessions will take place. Start of program (week 1), end of program (week 24), and a follow-up assessment (week 48). The participant will not be actively involved in the program during the 24 weeks leading up to the follow up assessment. The last assessment (week 48) is a follow-up assessment to determine long-term effects of the health program..

Data Collection

**25 Does the project include the use of participant questionnaire/s?**

Yes	X	No	
-----	---	----	--

(If yes, attach a copy of the Questionnaire/s to the application form and include this in your list of attachments (Q5))

If yes: i) indicate whether the participants will be anonymous (i.e. their identity unknown to the researcher). Yes  No

ii) describe how the questionnaire will be distributed and collected.

(If distributing electronically through Massey IT, attach a copy of the draft request letter to the Associate Director Service Delivery, Information Technology Services to the application form. Include this in your list of attachments (Q5) – refer to the policy on “Research Use of IT Infrastructure”).

(Note: All requests for IT related aspects of ethics committee approvals can be directed through the IT service desk in the first instance – the request will be registered and on a response timeline, with the Associate Director dealing with the request).

26 Does the project involve observation of participants? If yes, please describe. Yes  No

27 Does the project include the use of focus group/s? Yes  No

(If yes, attach a copy of the Confidentiality Agreement for the focus group to the application form)

If yes, describe the location of the focus group and time length, including whether it will be in work time. (If the latter, ensure the researcher asks permission for this from the employer).

28 Does the project include the use of participant interview/s? Yes  No

(If yes, attach a copy of the Interview Questions/Schedule to the application form)

**If yes, describe the location of the interview and time length, including whether it will be in work time.** *(If the latter, ensure the researcher asks permission for this from the employer)*

<b>29</b>	<b>Does the project involve sound recording?</b>	<b>Yes</b>	<input checked="" type="checkbox"/>	<b>No</b>	<input type="checkbox"/>
<b>30</b>	<b>Does the project involve image recording, e.g. photo or video?</b>	<b>Yes</b>	<input type="checkbox"/>	<b>No</b>	<input checked="" type="checkbox"/>

**If yes, please describe.** *(If agreement for recording is optional for participation, ensure there is explicit consent on the Consent Form)*

<b>31</b>	<b>If recording is used, will the record be transcribed?</b>	<b>Yes</b>	<input type="checkbox"/>	<b>No</b>	<input type="checkbox"/>
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**If yes, state who will do the transcribing.**

*(If not the researcher, a Transcriber’s Confidentiality Agreement is required – attach a copy to the application form. Normally, transcripts of interviews should be provided to participants for editing, therefore an Authority For the Release of Tape Transcripts is required – attach a copy to the application form. However, if the researcher considers that the right of the participant to edit is inappropriate, a justification should be provided below.) Yes, the researcher will do the transcribing. Transcripts of interviews will be provided for editing and consent will be sought before any publication or release of information.*

<b>32</b>	<b>Does the project involve any other method of data collection not covered in Qs 25-31?</b>	<b>Yes</b>	<input type="checkbox"/>	<b>No</b>	<input type="checkbox"/>
-----------	--	------------	--------------------------	-----------	--------------------------

**If yes, describe the method used.**

<b>33</b>	<b>Does the project require permission to access databases?</b>	<b>Yes</b>	<input type="checkbox"/>	<b>No</b>	<input checked="" type="checkbox"/>
-----------	---	------------	--------------------------	-----------	-------------------------------------

*(If yes, attach a copy of the draft request letter/s to the application form. Include this in your list of attachments (Q5). Note: If you wish to access the Massey University student database, written permission from Director, National Student Relations should be attached.)*

<b>34</b>	<b>Who will carry out the data collection?</b>
-----------	--

Victoria Chinn, PhD Student

Dr Michelle Thunders, Supervisor

Stephanie McPhail, PG Student

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*SECTION C: BENEFITS / RISK OF HARM (Refer Code Section 3, Para 10)*

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**35 What are the possible benefits (if any) of the project to individual participants, groups, communities and institutions?**

Free personalised health education and 6 month motivational support (1 year indirect via social media). On completion of the study, participants can request to receive their body composition results and program summary.

---

**36 What discomfort (physical, psychological, social), incapacity or other risk of harm are individual participants likely to experience as a result of participation?**

Some women may be anxious about taking part in genetic analysis. Participants may become anxious when completing questionnaires on body satisfaction, depression, and other markers of mental well-being. Additionally, some women may be uncomfortable having certain anthropometric measurements (i.e. hip, waist circumference) taken.

Blood collection could cause physical discomfort or stress if a pre-existing fear of needles exists.

---

**37 Describe the strategies you will use to deal with any of the situations identified in Q36.**

To reduce discomfort associated with body composition assessments, all testing will be completed by a female researcher, in quiet and private environment. Every measure will be taken to ensure this. Participant will be reminded they can withdraw from the study at any point with no consequence. The information sheet provides contact information for a support service, if participation results in undue anxiety. Thus both the health education support from the program and professional support as indicated on the information sheet will be provided.

---

**38 What is the risk of harm (if any) of the project to the researcher?**

Blood contact

---

**39 Describe the strategies you will use to deal with any of the situations identified in Q38.**

Gloves will be worn and sterile procedures will be used by protocol. Only needles with a safety cover will be ordered and used.

---

**40 What discomfort (physical, psychological, social) incapacity or other risk of harm are groups/communities and institutions likely to experience as a result of this research?**

---

**41 Describe the strategies you will use to deal with any of the situations identified in Q40.**

---

**42 Is ethnicity data being collected as part of the project?**

Yes  No

**If yes, please describe how the data will be used.**

*(Note that harm can be done through an analysis based on insufficient sample or sub-set numbers).*

Recruitment is not driven in any way by ethnicity however the study is not limited by ethnicity either. Ethnicity data will only be used for cultural reference if necessary when developing and working on goals with the individual i.e. food choices, cultural practices, etc.

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**43 If participants are children/students in a pre-school/school/tertiary setting, describe the arrangements you will make for children/students who are present but not taking part in the research.**

*(Note that no child/student should be disadvantaged through the research)*

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**SECTION D: INFORMED & VOLUNTARY CONSENT (Refer Code Section 3, Para 11)**

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**44 By whom and how, will information about the research be given to potential participants?**

By listed research team and information sheet.

---

45 Will consent to participate be given in writing? Yes  No

*(Attach copies of Consent Form/s to the application form)*

**If no, justify the use of oral consent.**

46 Will participants include persons under the age of 16? Yes  No

**If yes: i) indicate the age group and competency for giving consent.**

**ii) indicate if the researcher will be obtaining the consent of parent(s)/caregiver(s).** Yes  No

*(Note that parental/caregiver consent for school-based research may be required by the school even when children are competent. Ensure Information Sheets and Consent Forms are in a style and language appropriate for the age group.)*

47 Will participants include persons whose capacity to give informed consent may be compromised? Yes  No

*If yes, describe the consent process you will use.*

48 Will the participants be proficient in English? Yes  No

**If no, all documentation for participants (Information Sheets/Consent Forms/Questionnaire etc) must be translated into the participants' first-language.**

*(Attach copies of the translated Information Sheet/Consent Form etc to the application form)*

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SECTION E: PRIVACY/CONFIDENTIALITY ISSUES (Refer Code Section 3, Para 12)

49 Will any information be obtained from any source other than the participant? Yes  No

**If yes, describe how and from whom.**

50 Will any information that identifies participants be given to any person outside the research team? Yes  No

If yes, indicate why and how.

51 Will the participants be anonymous (i.e. their identity unknown to the researcher?) Yes  No

If no, explain how confidentiality of the participants' identities will be maintained in the treatment and use of the data.

In all use and reporting of results of data patients will be only referred to by identity number, only PI/AI/RA will know patient identity and identity number as PI/AI/RA will be carrying out measurements and distributing questionnaires to the participants. Participants will be assigned a numerical identifier and this will be written on all paper work and the name then detached from the forms.

52 Will an institution (e.g. school) to which participants belong be named or be able to be identified? Yes  No

If yes, explain how you have made the institution aware of this?

53 Outline how and where:

i) the data will be stored, and

In locked filing cabinet and password protected computer only, only PI has access.

ii) Consent Forms will be stored.

In locked filing cabinet, only PI has access.

54 i) Who will have access to the data/Consent Forms?

Only PI/AI

ii) How will the data/Consent Forms be protected from unauthorised access?

Locked filing cabinet, PI has only key to filing cabinet.

---

**55 How long will the data from the study be kept, who will be responsible for its safe keeping and eventual disposal? (Note that health information relating to an identifiable individual must be retained for at least 10 years, or in the case of a child, 10 years from the age of 16).**

*(For student research the Massey University HOD Institute/School/Section / Supervisor / or nominee should be responsible for the eventual disposal of data. Note that although destruction is the most common form of disposal, at times, transfer of data to an official archive may be appropriate. Refer to the Code, Section 4, Para 24.)*

Information will be kept for 10 years in a locked filing cabinet, after this period of time the data will be destroyed.

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**SECTION F: DECEPTION (Refer Code Section 3, Para 13)**

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**56 Is deception involved at any stage of the project?** Yes  No

If yes, justify its use and describe the debriefing procedures.

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**SECTION G: CONFLICT OF ROLE/INTEREST (Refer Code Section 3, Para 14)**

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**57 Is the project to be funded or supported in any way, e.g. supply of products for testing?** Yes  No

If yes: i) state the source of funding or support:

- Massey Academic Unit
- Massey University (e.g. MURF, SIF)
- External Organisation (provide name and detail of funding/support)

Seeking funding from IFNHH Postgraduate support funds and MURF. Other funding may be sought (ex. NIH).

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**ii) does the source of the funding present any conflict of interest with regard to the research topic?**

No

---

**iii) identify any potential conflict of interest due to the source of funding and explain how this will be managed?**

---

**58 Does the researcher/s have a financial interest in the outcome of the project?** Yes  No

**If yes, explain how the conflict of interest situation will be dealt with.**

---

**59 Describe any professional or other relationship between the researcher and the participants? (e.g. employer, employee, work colleague, lecturer/student, practitioner/patient, researcher/family member). Indicate how any resulting conflict of role will be dealt with.**

Possibility of lecturer/student as we are recruiting on the 3 main Massey campuses, however it is envisaged that the PhD student will do the majority of recruiting from the Massey campuses.

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**SECTION H: COMPENSATION TO PARTICIPANTS (Refer Code Section 4, Para 23)**

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**60 Will any payments, koha or other form of compensation or acknowledgement be given to participants?** Yes  No

**If yes, describe what, how and why.**

*(Note that compensation (if provided) should be given to all participants and not constitute an inducement. Details of any compensation provided must be included in the Information Sheet.)*

61 Are Maori the primary focus of the project? Yes  No

If yes: Answer Q62 – 65

If no, outline: i) what Maori involvement there may be, and

Recruitment will not be targeting or excluding any ethnicities. This study will recruit from the broad pool of New Zealand’s ethnic groups. Some participants may be Maori.

ii) how this will be managed.

Cultural sensitivities will be employed at all stages of the study.

62 Is the researcher competent in te reo Maori and tikanga Maori? Yes  No

If no, outline the processes in place for the provision of cultural advice.

Women play a major role in the healthcare of the whānau and results concerning Māori women’s health would be directly translated to local iwi and medical practitioners. Beyond scientific outputs (manuscripts, conference proceedings), the media would be utilized in disseminating information to the larger public.

63 Identify the group/s with whom consultation has taken place or is planned and describe the consultation process.

*(Where consultation has already taken place, attach a copy of the supporting documentation to the application form, e.g. a letter from an iwi authority)*

Please see letter of support from Nick Roskruge

64 Describe any ongoing involvement of the group/s consulted in the project.

N/A

65 Describe how information resulting from the project will be shared with the group/s consulted?

Information from this project will be discussed

---

**SECTION J: CULTURAL ISSUES (Refer Code Section 3, Para 15)**

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**66 What ethnic or social group/s (other than Maori) does the project involve?**

The recruitment of participants is not based on ethnicity. However, we do anticipate possible recruitment of Pasifika (inclusive of all nationalities) and Asian.

**67 Are there any aspects of the project that might raise specific cultural issues?** Yes  No

**If yes, explain. Otherwise, proceed to Section K.**

**68 Does the researcher speak the language of the target population?** Yes  No

**If no, specify how communication with participants will be managed.**

**69 Describe the cultural competence of the researcher for carrying out the project.**

*(Note that where the researcher is not a member of the cultural group being researched, a cultural advisor may be necessary)*

I am of Chinese Asian descent and have a very rounded knowledge behind this culture. I've done previous research with Maori participants specifically conducting semi-structured interviews surrounding diet. I have much experience working with people of different backgrounds and approach any situation in a culturally sensitive manner. This being said, further advice is being sought from advisors with more experience and specific advice regarding New Zealand's unique ethnic groups in human health research.

**70 Identify the group/s with whom consultation has taken place or is planned.**

*(Where consultation has already taken place, attach a copy of the supporting documentation to the application form)*

Please see letter of support from Dr. Riz Firestone.

---

**71 Describe any ongoing involvement of the group/s consulted in the project.**

N/A

---

**72 Describe how information resulting from the project will be shared with the group/s consulted.**

N/A

---

**73 If the research is to be conducted overseas, describe the arrangements you will make for local participants to express concerns regarding the research.**

N/A

---

## **SECTION K: SHARING RESEARCH FINDINGS (Refer Code Section 4, Para 26)**

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**74 Describe how information resulting from the project will be shared with participants and disseminated in other forums, e.g. peer review, publications, and conferences.**

*(Note that receipt of a summary is one of the participant rights)*

Health education will be continuously shared with participants during 6 month intervention. A summary of results and progress will be available to participant after intervention. Journal articles- at least 3 high quality articles will be able to be written from the wealth of data generated from this project: Journals suitable for publication include:

- 1) On study design and intervention program:  
Nutrition research (impact 2.6), Appetite (impact 2.5), The BMJ ( impact 16.4)
- 2) On Epigenetic analysis and change in methylation status  
Nucleic acids Research ( impact 8) Annals of human genetics (impact 1.9) Clinical Epigenetics (impact 6.6) Epigenetics (impact 4.58),
- 3) On use of social media site to support participants throughout and after intervention  
Journal of Medical Internet Research (impact 4.7)

Presentation at Nutrition in Medicine conference 2016 (Australia) and the 13<sup>th</sup> International Congress of Human Genetics Conference in Kyoto 2016

---

**SECTION L: INVASIVE PROCEDURES/PHYSIOLOGICAL TESTS (Refer Code****Section 4, Para 21)**

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**75 Does the project involve the collection of tissue, blood, other body fluids; physiological tests or the use of hazardous substances, procedures or equipment?** Yes  No

**If yes, are the procedures to be used governed by Standard Operating Procedure(s)? If so, please name the SOP(s). If not, identify the procedure(s) and describe how you will minimise the risks associated with the procedure(s)?**

Veins will be carefully assessed for easiest and most efficient blood draw for participant's comfort and sample quality. Hands will be washed at 3 points: upon entering the room and greeting participant, before wearing gloves, and after blood draw is complete. Participant will be informed of the procedure and purpose for taking blood. They will also be reminded their participation is completely voluntary and can withdraw at any time. After choosing venepuncture site, site will be sterilized by alcohol swab and left to air dry before entry (to prevent any stinging). In the instance of an unsuccessful blood draw, one other attempt (in different site) will be made (upon consent from the participant). If unsuccessful this will complete blood draw. One 4 mL EDTA collection tube will be used. Safeguard needles with snap back lids to cover needles will be used for safety for both participant and researcher. Immediately after blood draw, needle will be covered by snap back plastic covering and disposed in the sharps bin. Any other biohazard material will be disposed in biohazard autoclave bags. Bloods will be (stored by refrigeration) in preparation for RNA extraction. Care will be taken to assess participants arm post needle entry to ensure blood clotting has occurred and participant is happy.

---

**76 Does the project involve the use of radiation (x-ray, CT scan or bone densitometry (DEXA))?** Yes  No

**If yes, has the Massey Licensee been contacted and consulted?** Yes  No

*(A copy of the supporting documentation must be provided with the ethics application, i.e. relevant SOP, participant dose assessment calculation sheet and approval of the dose assessment from the relevant authority). NOTE: See “Additional Information for Researchers” (Item 4.2) document for further detail.*

*(If yes to Q75 and/or Q76, complete Section L; otherwise proceed to Section M)*

- 77 Describe the material to be taken and the method used to obtain it. Include information about the training of those taking the samples and the safety of all persons involved. If blood is taken, specify the volume and number of collections.**

VChinn trained in clinical phlebotomy will undertake the blood collection. Methods stated above in section 75. Same procedure as blood collection instructed by Capital and Coast protocol at Wellington Hospital (taught here.) One 4 mL EDTA collection tube will be used. Safeguard needles with snap back lids to cover needles will be used for safety for both participant and researcher. Participant will be informed of the procedure and purpose for taking blood. They will also be reminded their participation is completely voluntary and can withdraw at any time.

- 78 Will the material be stored?** Yes  No

**If yes, describe how, where and for how long.**

Blood and epigenetic information will be stored up to 2 years (duration of study) unless specific cultural request is made concerning disposal of bio-material.

- 79 Describe how the material will be disposed of (either after the research is completed or at the end of the storage period).**

*(Note that the wishes of relevant cultural groups must be taken into account)*

Bloods and epigenetic information will be disposed of under biohazard precautions by autoclave unless otherwise specified. Care and sensitivity will be taken to meet cultural needs and requests.

- 80 Will material collected for another purpose (e.g. diagnostic use) be used?** Yes  No   
 Yes  No

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**If yes, did the donors give permission for use of their samples in this project?** (*Attach evidence of this to the application form*).

**If no, describe how consent will be obtained. Where the samples have been anonymised and consent cannot be obtained, provide justification for the use of these samples.**

---

**81 Will any samples be imported into New Zealand?** Yes  No

**If yes, provide evidence of permission of the donors for their material to be used in this research.**

---

**82 Will any samples go out of New Zealand?** Yes  No

**If yes, state where.**

*(Note this information must be included in the Information Sheet)*

---

**83 Describe any physiological tests/procedures that will be used.**

RRBS sequencing carried out by NZGL.

---

**84 Will participants be given a health-screening test prior to participation?** (*If yes, attach a copy of the health checklist*) Yes  No

***Reminder: Attach the completed Screening Questionnaire and other attachments listed in Q5***

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**SECTION M: DECLARATION** *(Complete appropriate box)*

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**ACADEMIC STAFF RESEARCH**

**Declaration for Academic Staff Applicant**

I have read the Code of Ethical Conduct for Research, Teaching and Evaluations involving Human Participants. I understand my obligations and the rights of the participants. I agree to undertake the research as set out in the Code of Ethical Conduct for Research, Teaching and Evaluations involving Human Participants. My Head of Department/School/Institute knows that I am undertaking this research. The information contained in this application is to the very best of my knowledge accurate and not misleading.

Staff Applicant's Signature

Date:

.....

---

**STUDENT RESEARCH**

**Declaration for Student Applicant**

I have read the Code of Ethical Conduct for Research, Teaching and Evaluations involving Human Participants and discussed the ethical analysis with my Supervisor. I understand my obligations and the rights of the participants. I agree to undertake the research as set out in the Code of Ethical Conduct for Research, Teaching and Evaluations involving Human Participants.

The information contained in this application is to the very best of my knowledge accurate and not misleading.

Student Applicant's Signature

Date:

.....

**Declaration for Supervisor**

I have assisted the student in the ethical analysis of this project. As supervisor of this research I will ensure that the research is carried out according to the Code of Ethical Conduct for Research, Teaching and Evaluations involving Human Participants.

Supervisor's Signature

Date:

.....

Print Name

.....

---

**GENERAL STAFF RESEARCH/EVALUATIONS**

**Declaration for General Staff Applicant**

I have read the Code of Ethical Conduct for Research, Teaching and Evaluations involving Human Participants and discussed the ethical analysis with my Line Manager. I understand my obligations and the rights of the participants. I agree to undertake the research as set out in the Code of Ethical Conduct for Research, Teaching and Evaluations involving Human Participants. The information contained in this application is to the very best of my knowledge accurate and not misleading.

General Staff Applicant's

Date:

Signature

.....  
**Declaration for Line Manager**

I declare that to the best of my knowledge, this application complies with the Code of Ethical Conduct for Research, Teaching and Evaluations involving Human Participants and that I have approved its content and agreed that it can be submitted.

Line Manager's Signature

Date:

Print Name

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**TEACHING PROGRAMME**

**Declaration for Paper Controller**

I have read the Code of Ethical Conduct for Research, Teaching and Evaluations involving Human Participants. I understand my obligations and the rights of the participants. I agree to undertake the teaching programme as set out in the Code of Ethical Conduct for Research, Teaching and Evaluations involving Human Participants. My Head of Department/School/Institute knows that I am undertaking this teaching programme. The information contained in this application is to the very best of my knowledge accurate and not misleading.

Paper Controller's Signature

Date:

.....  
**Declaration for Head of Department/School/Institute**

I declare that to the best of my knowledge, this application complies with the Code of Ethical Conduct for Research, Teaching and Evaluations involving Human Participants and that I have approved its content and agreed that it can be submitted.

Head of Dept/School/Inst

Date:

Signature

Print Name



## Appendix X: Supporting Letters for Ethics Application

Dr's., M Thunders, S Shultz  
A/Prof., R Page; J Coad; R Kruger  
Victoria Chinn (Student)

College of Health - IFNHH  
Massey University  
Wellington, 6021

Tena koutou

Re: Project - NEXT LEVEL! A 24 week individualised health program based on small achievable goals to develop healthy lifestyle habits.

*Tena koe i o tatou aitua maha e ngapu nei te whenua i to ratou hinanga.*

*Heoi ano, e taea te aha atu i te tangi, i te maumahara ki a ratou me ta ratou i mahi ai?*

*No reira, waiho ratou ki a ratou, ko tatou ki a tatou, tena ano koe.*

Thank you for giving me the opportunity to provide feedback to your proposed project 'NEXT LEVEL! A 24 week individualised health program based on small achievable goals to develop healthy lifestyle habits'. I am very happy to be able to support your proposal through advice on communications between yourself and Maori communities or cultural matters where appropriate. I do not expect there to be any reason to extend the study beyond your proposed parameters, however, as Kaiarahi Maori for the College of Sciences within Massey University my role is to facilitate the involvement of our Maori community across Aotearoa/New Zealand in both the education and research opportunities for Maori as well as contribute to strategic activities within the college. We have a long-standing history with almost all iwi around the country and consequently there are established relationships which can contribute to the involvement of Maori generally with projects such as yours if appropriate.

I trust this letter reflects the discussions we have had around the support which I and my office can provide. Please feel free to contact me at any time for further consideration of the support offered or if you require any further information relative to your research application. All the best for your project.

No reira, nga mihi atu

Nick Rahiri Roskruge

*Kaiarahi Maori  
Te Wahanga Putaiao (College of Sciences)  
Massey University*

01 December 2014

**RE: Letter of Support: Victoria Chinn**

---

Tēnā tātou te whanau,

I have been approached for bicultural consultation regarding a PhD project on women's health being conducted by Victoria Chinn who is enrolled in her PhD with the Institute of Food, Nutrition and Human Health (IFNHH). Her study is titled '*NEXT LEVEL! A 24 week individualised health program based on small achievable goals to develop healthy lifestyle habits*'. It investigates the impact of a unique diet and exercise intervention designed to develop long-lasting, healthy lifestyle habits with women between the ages of 18 and 40. She is being supervised by Dr. Michelle Thunders (IFNHH) and is being co-supervised by Dr. Sarah Shultz (School of Sport and Exercise), A/Prof Rachel Page (IFNHH), Dr. Rozanne Kruger (IFNHH) and A/Prof Jane Coad (IFNHH).

In my opinion this study meets the mandatory requirements of cultural consultation based on the following points:

1. There may or may not be people who identify as Māori who volunteer for this project given the specific demographic required for the study. If indeed there are participants that identify as Maori in the study, I am happy to act in the capacity of advisor if required by either the participants and/or the researchers;

2. Subsequently, given the level of appropriate consultation by Victoria I am satisfied that her application has been consistent with *Te Tiriti o Waitangi*/The Treaty of Waitangi as stated in policy 1.2:

“To consult meaningfully with tangata whenua on all research that concerns Māori. And to ensure that research maintains the integrity of Māori.”<sup>5</sup> (Smith, 2010, p. 3)

3. In regards to the use of blood samples for the purposes of the research project, I provide the following information:

**a. Tikanga concept: Tapu**

The use of blood falls under the specific concept of *tapu* (sacred/set apart)<sup>6</sup>. Mead (2003) succinctly states that “Blood is very *tapu* and must be treated with care” (p. 49) and Barlow (2001)<sup>7</sup> refers to blood as *Tapu Māheuheu* (p. 129) which is a reference of *tapu* and its connection to personal hygiene and bodily fluids. In particular Barlow (2001) comments that certain rituals may need to be performed to protect an individual's *tapu* if ‘contamination’ (p. 129) has occurred.

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<sup>5</sup> Smith, L. T. (2010). NZARE Ethical Guidelines. New Zealand Association for Research in Education (NZARE)/Te Hunga Rangahau Mātauranga o Aotearoa (PDF). <http://www.nzare.org.nz/research-ethics.html> retrieved January 12 2011.

<sup>6</sup> Mead, H. M. (2003). *Tikanga Māori: Living by Māori values*. Wellington, NZ: Huia Publishers.

<sup>7</sup> Barlow, C. (2001). *Tikanga whakaaro: Key concepts in Māori culture*. Auckland, NZ: Oxford University Press.

Recommendation:

(i) The participant be informed of their right to request an act of *tikanga* in any form that acknowledges the *tapu* nature of blood i.e., *karakia* (blessing), *whakatau* (introduction) and *tautoko* (support, usually in the form of *whānau* (family) members) and any other process of *tikanga* that they may require.

**b. Tikanga concept: Taonga**

Consideration is given to *Article Two* of *Te Tiriti o Waitangi* (The Treaty of Waitangi) referring to the term *taonga* (gift or prized possession). In the context of *Te Tiriti* (the Treaty) the term *taonga* refers to both tangible and intangible possessions/assets hence blood as a tangible *taonga* needs to be regarded and valued in scientific research as a ‘gift/prized possession’ previously mentioned.

Recommendation:

(ii) The blood sample provided remains the property and *taonga* of the participant throughout the entire research process and the right to have the sample returned be extended.

I am satisfied with the communication and subsequent discussions I have had with Victoria and I am impressed with the steps Victoria has taken to proactively seek the appropriate level of consultation required for ethical approval. I hope this letter of support will be sufficient to that end. I am happy to provide ongoing support and advice either to Victoria, her supervisors and her participants throughout the data gathering and dissemination process if required.

If the committee have any queries please do not hesitate to contact me at the details below.

Kia tau iho ngā manaakitanga ki a tātou kātoa,

**Bevan Erueti (Taranaki, Ngāti Tūwharetoa, Te Atihaunui-a-Pāpārangī)**

Lecturer, Te Kura o te Matauranga /Institute of Education

Email: B.Erueti@massey.ac.nz

Phone: + 64 6 356 9099 ext. 81063



**MASSEY UNIVERSITY**  
TE KUNENGA KI PŪREHUROA

23 January 2015

To whom it may concern,

I am writing this letter in support of Ms Victoria Chin's ethics application for her doctoral work.

We have met and discussed sensitive and cultural issues for Pacific women, should they be involved in her project. At our meeting, we also discussed the cultural parameters and expectations of information sharing and collection and ownership of biological materials. I have since given her reference details to the recently updated (2014) guidelines on Pacific health research from the Health Research Council of New Zealand, so that she may be well informed of how to manage and consult with Pacific participants in relation to biological materials, and indigenous knowledge.

Ms Chin is welcome to contact me at any time to discuss any further cultural issues in relation to Pacific women.

I wish her the best in her future research endeavors.

Best wishes



**Dr Tupa'ilevaililigi Riz Firestone**, Research Officer  
Centre for Public Health Research, [publichealth.massey.ac.nz](http://publichealth.massey.ac.nz)  
E: [r.l.firestone@massey.ac.nz](mailto:r.l.firestone@massey.ac.nz)  
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A: Massey University, Wellington Campus, PO Box 756, Wellington 6140  
Courier Address Block 3, Level D, Entrance B Wallace St, Wellington 6021



MASSEY UNIVERSITY  
TE KUNENGA KI PŪREHUROA

30 January 2015

To whom it may concern

Letter of support for Victoria Chinn's PhD human ethics application

It was my pleasure to meet with Victoria to discuss her PhD research. As the Pasifika Learning Advisor for the Massey University Wellington Campus, I informed Victoria of the campus and University student profile to highlight the diverse cultural backgrounds and experience of Pasifika students.

We discussed engagement strategies that demonstrate an empathetic understanding of common Pacific values that would be of benefit when communicating and connecting with potential Pacific participants.

I also referred Victoria on to Dr Riz Firestone, a research officer with expertise in the areas of Pacific research and health to further advise on cultural sensitivity and engaging with Pacific women.

I wish Victoria all the very best in her doctoral journey and look forward to being of further assistance if required.

Yours faithfully

A handwritten signature in blue ink, appearing to read 'Rachael Leafe'.

Rachael Leafe  
Pasifika Learning Advisor/Pasifika Coordinator for the College of Creative Arts



## **Appendix Y: MiBand Reliability and Validity Report**

**Corresponding Author:** Fricke Anja, 4D Udy Street, Petone, Lower Hutt 5012, NZ, Ph: 0212643651, E-mail: Frickeanja@hotmail.co.nz

**Authors:** Fricke A BHIthSci (Hon), Chinn V (BA), Yaghoubi M (MA), Shultz S (PhD, ATC)

**Title: The importance of testing activity trackers for reliability and validity**

(unpublished)

**Keywords:** activity tracker; step count; accuracy; fitness; physical activity

**Word Count: 1983**

**Conflicts of interest:** The authors have no conflicts of interest to declare.

### **Abstract**

Activity trackers are a non-invasive and objective way of monitoring activity levels and have seen an exponential increase in their availability and affordability. Activity trackers are commonly worn on the wrist or ankle and can count steps, measure walking distance, calories and some even include heart rate measurements. These devices are affordable and easy to use; however they must be valid in order to track physical activity levels accurately. Activity trackers are therefore commonly tested for their validity and reliability. Testing commonly includes laboratory testing and testing in free-living conditions. Laboratory testing includes walking on a treadmill whereby the step count of the activity tracker can be compared a manual step count. During testing under free-living conditions, step counts of the activity tracker and a previously validated activity tracker are compared after wearing both for a minimum of 5 days. Currently validated activity trackers include the Yamax Digiwalker SW-701 pedometer, Omron HJ-720 pedometer, Kenz Lifecorder, Actiped, Fitbit Zip, Nike+ Fuelband, Omron pedometer, Fitbit Flex and Jawbone Up. The recently tested MiBand however, did not provide a valid step count in neither laboratory

conditions or free-living conditions. The MiBand did show a reliable step count and could therefore only be used for intervention purposes.

## **Introduction**

Regular exercise is the most prescribed method for overall health improvement and reduction of disease risk (1, 2). Physical activity has a range of benefits for people of all ages from young children through to the elderly. The most commonly prescribed forms of physical activity recommended by health professionals and practiced by lay people are ambulatory activities such as walking and running (3). Health professionals, together with many organisations, have developed recommendations for appropriate activity levels that promote health and well-being (3). The guideline that is recommended for a broad spectrum of people is to perform at least 10,000 steps a day to maintain physical health (2, 4). There is an increasing number of people who do not meet their current physical activity guidelines (5). Furthermore, most people are simply not aware enough of their current physical activity levels and tend to overestimate their activity participation (2). Activity trackers have been developed that are able to track the amount of steps taken as well as distance covered when walking or running.

### **Activity trackers as a solution to track physical activity levels**

Activity trackers are a non-invasive and objective way of monitoring and evaluating activity levels based on movement, as well as sleep-wake patterns (6). Activity trackers have been used by researchers to identify correlated physical activity behaviours and provide a more robust estimate of population levels of physical activity (7). Although research-based activity trackers provide highly detailed data for analysis, these activity trackers are not particularly consumer friendly as they are expensive, bulky, and often require scientific software to run (6).

Within the last decade, there has been an exponential increase in the availability of affordable and consumer-orientated devices for monitoring physical activity. Commercially available activity trackers include anything from pedometers to more complex accelerometers;

most are small and commonly worn on the wrist, hip, or ankle and include features such as counting steps taken, distance, calories and even heart rate measurements (2). These devices are affordable and easy to use, which makes them attractive for both private and scientific use (2). Furthermore, newer devices are often easy to sync wirelessly through Bluetooth on the computer or smartphone for more detailed monitoring. Battery life varies, but one charge can be sustained for up to a few months and are generally easily charged again via USB. With a variety of colours and attractive designs, activity monitors have become extremely consumer friendly and highly popular.

The increasing use of physical activity trackers has been shown to be effective in promoting changes to physical activity levels (8). Yet many doctors, physicians and physical therapists lack confidence in prescribing activity monitors due to uncertainty surrounding the tracker's accuracy and reliability (4). One of the greatest obstacles to using trackers in health care has been the different technology across manufacturers and models of activity trackers, which may lead to variations in both the measurements and interpretation of activity information (3). Thus, activity trackers must be valid and reliable as inaccurate measurements can affect the overall health monitoring (2, 9).

### **Methods of validation and reliability testing**

Activity trackers are tested for reliability and validity several different ways and include laboratory testing as well as testing under free-living conditions. In controlled or laboratory settings, activity trackers can be validated using the gold standard step counting criterion, which usually involves a manual step count. Validating activity trackers in free living conditions is also important for intervention and population data collection (3), as well as implications for natural variations in walking speeds, directions and intensities that cannot be replicated in a laboratory environment (2).

#### **Laboratory testing**

There are many ways to validate and test activity trackers for reliability in laboratory conditions. The most commonly used method includes walking on the treadmill. Other methods have tried to more closely represent free-living conditions and either added gradients on the treadmill or included controlled walks in the outside environment as well as ascending and descending flights of stairs. One example is the study by Lee et al (3), whereby four different activity trackers (i.e. Yamax Digiwalker SW-701 pedometer, Omron HJ-720 pedometer, Polar Active accelerometer) were tested against the Actigraph gt3x+ accelerometer, a research-based tool that has been consistently validated against direct measures of energy expenditure. While three of the tested activity trackers performed well during moderate and brisk walking speeds, the Polar Active accelerometer performed poorly at all speeds (3). These results support the need to not only test reliability and validity of activity trackers, but also across different speeds.

Some activity trackers might be suitable for different populations or different research settings. One study by Abel et al (1) tested two different activity trackers (the Kenz Lifecorder and the Actigraph) using a manual step count (1). In this example, one of these activity trackers (Kenz Lifecorder) showed a consistently more accurate step count at lower speeds compared to the other activity tracker (Actigraph). Therefore, the Kenz Lifecorder could be more suitable for populations with slower gait (e.g. elderly), but would be less suitable for populations with faster gait (e.g. fit and younger adults).

Different studies have also tried to validate activity trackers in laboratory conditions that more readily represent free-living conditions; results of these studies can identify changes in the accuracy activity tracker measurements across different activities (e.g. walking, running, hill and stair climbing) and environments (i.e. indoor, outdoor). Activity trackers such as the Yamax pedometer and the Actigraph performed better during the indoor step counts while the Actiped performed better during outdoor step counts (10). Therefore, certain activity trackers might be more suitable for research environments whereby testing is predominantly indoors on a

treadmill. Huang et al (4) tested several different activity trackers including the Fitbit One, Fitbit Flex, Fitbit Zip, Garmin Vivofit, Nike+ FuelBand, Jawbone Up 24 and the Yamax CW-701. Step counts were tested while walking at three different treadmill speeds as well as within different outdoor walking conditions, including walking on a flat paved road and ascending and descending several flights of stairs. Results indicated that while all activity trackers showed strong reliability and validity during level ground walking, significant differences were found during stair climbing. All activity trackers underestimated step count but overestimated distances during stair climbing (9). Thus, these activity trackers might not be suitable for accurately monitoring physical activity in people who do regular hill and trail walks, as these commonly include uneven tracks, which could limit the performance of activity trackers.

### **Free-living conditions**

In addition to laboratory testing, an activity tracker must also be validated in free living conditions, as it more typically reflects daily life. The most common validation protocol in free living conditions is for participants to wear a previously validated activity tracker and the tested activity tracker(s) for a number of consecutive days.

Most reliable and accurate results for validating activity trackers in free-living conditions were produced by studies that tested activity trackers for at least four days and whereby tested activity trackers were worn at the same position. Positioning of the activity trackers is one of the most important criterion to produce accurate results (2, 8, 11). Wearing different activity trackers at different positions on the body prevents an accurate comparison between trackers, since activity trackers detect step counts by body movement, which will vary by body parts (2). Activity trackers that have shown to be valid and reliable in free-living conditions include the Fitbit Zip, Nike+ Fuelband, Omron pedometer, Fitbit Flex, Jawbone Up, and the Yamax Digiwalker, while the Fitbit Zip proved to be the most accurate activity tracker in counting steps during free-living conditions (1-3, 8).

### **The new commercially available Mi-Band**

The MiBand (Xiaomi Inc, Beijing) is a commercially available low-cost activity tracker, capable of counting steps and distance covered as well as tracking sleep pattern. It is less expensive than most other commercially available fitness trackers, costing only USD \$15. The MiBand is worn on the non-dominant wrist and includes a small and lightweight aluminium sensor. The MiBand claims a battery life of 30 days and it is available in a variety of colours, making it highly attractive to consumers. Data from the MiBand is received via Bluetooth on a smartphone using the MiFit application. The MiBand is relatively new on the market, having only been released in July 2014 and has not been tested for reliability and validity. To validate the step count of the MiBand activity tracker in laboratory conditions, participants walked on a treadmill at five different speeds. A manual step count was employed across two independent researchers; laboratory conditions were repeated over two sessions separated by 7 days. Between laboratory sessions, free-living conditions were tested with participants wearing both the MiBand and the validated Actigraph on the non-dominant wrist. While statistics indicated that the MiBand is a reliable tool for counting steps between days, particularly around the most common adult walking speeds, step counts varied greatly when compared to both manual or Actigraph measurements (2); thus, the MiBand was not supported as a valid tool for monitoring physical activity.

Reliability and validity of the MiBand was assessed in similar ways to previously published research on other commercially available products (2, 3, 5). Although most consumer available activity trackers have shown to slightly overestimate step counts in free-living conditions (2), the MiBand showed consistently lower step counts during both laboratory and free-living conditions. Therefore, consumers who buy the MiBand and wear it throughout the day can most likely expect the step count shown to be significantly lower than the actual step count. The goal of consumer available activity trackers is to provide individuals with objectively monitor physical

activity data that are easy to understand. Because the MiBand underestimates the step count, it fails to achieve this goal. Although an underestimation of steps could motivate people to perform more exercise so that they reach their daily step goal, it could also have negative psychological impacts on the individual (12). Unattainable goals can lead to discouragement, loss of interest and eventually even failure (13). For those individuals who use the MiBand to achieve recommended daily step counts for healthier lifestyles, inaccurate data, particularly when underestimated, can discourage users.

Although the MiBand was not considered to be accurate, the step counts provided were consistent. The MiBand could work greatly as an inexpensive tool to monitor the effectiveness of an intervention for private use as well as in research settings. Instead of trying to reach the recommended guideline for step counts in adults, consumers can use the MiBand to improve on their own daily step count. The MiBand could also potentially be used in research settings as an inexpensive way to monitor pre- and post-intervention changes, in order to identify the progress or efficacy of the intervention.

### **Conclusion**

Current studies on validity and reliability of activity trackers showed that the Yamax Digiwalker SW-701 pedometer, Omron HJ-720 pedometer, Kenz Lifecorder, Actiped, Fitbit Zip, Nike+ Fuelband, Omron pedometer, Fitbit Flex and Jawbone Up all provided valid step counts, while the Polar Active accelerometer has been the only tested activity tracker not to provide a valid or reliable step count. The Kenz Lifecorder showed a more accurate step count at lower speeds; thus, it might be more suitable for populations with slower gait. The Actiped performed better during outdoor environments than on a treadmill, and therefore could be less suitable for indoor research settings. Several studies agreed that the Fitbit Zip provided the most valid and reliable results in free-living conditions. Unfortunately, the recently tested MiBand did not show a valid step count in any conditions. Although the MiBand consistently underestimated overall step counts, it did provide reliable results and could therefore be used for intervention purposes only. It is highly critical that activity trackers are tested for their validity and reliability before

being used by researchers and consumers. A non-validated activity tracker that shows inaccurate measurements and is used to monitor physical activity levels could negatively influence an individual's health progress.

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## Appendix Z: Variation of Level Progression

