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**Obesity Management in Rural New Zealand General Practice from
Healthcare Professional and Client Perspectives**

A thesis
submitted in fulfilment
of the requirements for the degree
of
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at
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by
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Abstract

Obesity is a health issue which currently affects over 34% of New Zealand (NZ) adults. Obesity, if left unchecked, leads to further physical and psychosocial health complications and an overall poor quality of life. People living in rural communities, high deprivation areas, as well as Indigenous Māori and Pacific Island populations in NZ, experience significant obesity health inequities and have a high-risk of developing obesity. General practice clinicians are positioned to be 'best suited' to deliver effective obesity healthcare in their practice, however, despite weight management intervention options being available through general practice, the obesity rates have continued to rise in the last 30 years. This suggests that there are potentially barriers to achieving a healthy weight in this context.

The aim of this research thesis is to understand the experiences with, and barriers to, effective obesity management in general practice from clinician and client perspectives to identify areas of improvement in the future.

This research thesis examines obesity healthcare in NZ general practice using a sequential explanatory mixed method research design in three parts. Firstly, a literature review study was conducted as a baseline point to identify the efficacy of any weight management interventions that are available in general practice. Secondly, a quantitative exploratory survey was conducted with Waikato region general practitioners (GP's). Lastly, interviews with rural clinicians (GPs, nurses, and Indigenous Māori health professionals) and clients (patients engaging with rural general practice) were then conducted to understand the more in-depth perspectives of any barriers experienced with delivering, or engaging with, obesity management in general practice.

The experiences of both clinicians and clients were found to be complex and nuanced, with each participant having a unique experience with obesity management. Concepts such as effective yet inaccessible weight management interventions, interventions not suitable for sociocultural health needs, conflicting nutritional guidelines, lack of rural general practice systemic support, the unique and time consuming nature of obesity 'treatment', complications with the role of a clinician in obesity management, stigma or power imbalances in the general practice context, social determinants of health, the obesogenic environment, privatised weight management programmes and the individualised nature of sociocultural norms were found to be significant to effective obesity management.

This research thesis identified that the positioning of general practitioners as 'best suited' for delivering effective obesity healthcare in their practice was questionable. Potentially, the clinician role is better suited as a supportive one to an obesity health specialist who can meet the more holistic needs of a client when it comes to weight management. The current health model generates difficulties for clinicians to deliver comprehensive healthcare for such a complex and individualised health issue. Future research should look to develop weight management options that are suitable for rural and indigenous health needs to improve quality of life for clients and reduce health inequities. In addition, wider critical reflection on the current obesity healthcare model and the feasibility of a more specialist service outside general practice is warranted.

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Chapter 1: Introduction

Obesity Overview

Obesity is a major health concern in New Zealand (NZ) and across the world. The World Health Organization (WHO) and Te Whatu Ora Health NZ (national health system, referred to as Health NZ from this juncture) define obesity as an excessive amount of fat accumulation on an individual's body that can lead to further health issues (Ministry of Health, 2022b; World Health Organization, 2021a). The WHO reports obesity rates have tripled since 1975 whereby in 2016 more than 1.9 billion adults were overweight with 650 million of these adults being obese (World Health Organization, 2021b). NZ has been identified as having the third highest obesity rate behind America and Mexico (in the OECD) (Organisation for Economic Co-operation and Development (OECD), 2017). The 2020/2021 NZ Health Survey reported one in three NZ adults (34%) (aged 15 years and over) were obese which has increased from the 31% in 2019/2020 (Ministry of Health, 2021b). The prevalence of obesity differs with ethnicity in NZ with 51% of Indigenous Māori, 71% of Pacific, 19% of Asian, and 32% NZ/European adults classed as obese (Ministry of Health, 2021b). It has been found that adults living in the most socioeconomically deprived areas on NZ are 1.6 times more likely to be obese as those living in the least deprived areas (Ministry of Health, 2021b). The latest health survey also highlighted that obesity also differs by age with 25-34 year olds having an obesity rate of 28.1%, 35-44 year olds at 35%, 45- 54 year olds at 37.4%, and 55-64 year olds at 37.3% (New Zealand National Health Survey, 2017). Adults aged between 25-65 were reported to be at the highest risk of developing obesity and were therefore the focus of this research thesis. Rural communities comprise a significant portion of the obesity statistics worldwide (NCD Risk Factor Collaboration, 2019) with many of NZ's rural communities also linked with high deprivation levels (Environmental Health Indicators New Zealand, 2018).

Obesity is also a risk factor in the development of other health, and health system, concerns. Obesity, if left unchecked, can lead to other health concerns including physical (type 2 diabetes, heart disease, stroke, cancer) and psychosocial or sociocultural (depression, anxiety, social or cultural isolation, low educational and employment opportunities, stigma and discrimination) comorbidities (Abilés et al., 2010; Goettler et al., 2017; Lewis et al., 2011; Ministry of Health, 2022b; World Health Organization, 2021b; Zhao et al., 2009). The high rates of obesity and related comorbidities have consequently made obesity shift from being regarded as a health concern to a reported 'epidemic' (World Health Organization, 2021a). Health systems across the world and in NZ are having to deal with not only trying to prevent increasing rates of obesity, but also addressing obesity in individuals with comorbid conditions. It was predicted in 2011 that by 2030 in America and the United Kingdom (UK) alone, there will be 6 to 8.5 million more cases of diabetes, 5 to 7-7.3 million more cases of heart disease and stroke, along with 492,000 – 669,000 cases of cancer, equating to about a 2 billion GBP per year cost on the national health service (\$4 billion NZD per year) (Wang et al., 2011). This strain is supported by NZ literature (Clough & Destremau, 2015) which indicated an expectation that there will be an increase in financial pressures for NZ similar to that seen in the UK, with further sociocultural and environmental impact expected also. Obesity, and obesity related comorbidities, pose a significant health risk to an individual's quality of life (Forhan & Gill, 2013; Nigatu, 2016) and a risk to the financial sustainability of the NZ health system should rates continue to increase.

Obesity Management Sectors

Obesity is considered a modifiable health condition (World Health Organization, 2021b) whereby it can be prevented and reversed through effective weight management strategies. In NZ, obesity is regarded as a health risk and obesity management is situated within the national health system (Ministry of Health, 2022b). There are three main sectors for effective obesity healthcare from a national health system perspective and are all important to the wider obesity healthcare goals. These are: primary care approach (which generally deals with low and medium risk clients); a specialist or secondary care approach (which addresses those at risk of serious negative health outcomes or premature death); and public health (which takes a population approach to reducing obesity where small changes to large numbers of people can have more significant impact than a large change in a small number of population). In a systems-based approach, these sectors should be used in conjunction with each other to maximise obesity health improvement outcomes (Ministry of Health, 2022b). The focus of this research is on one sector: an individual in the general practice context. However, even though the secondary specialist sector and population health sectors are not detailed in this thesis, elements of these sectors do overlap with the general practice sector and will be included where relevant.

Obesity Treatment Sectors

In the western health model, obesity is considered largely to be the result of excess caloric energy being consumed through ingested food than the caloric energy being expended through bodily functioning and exercise (Hill, 2012; Ministry of Health, 2022b; World Health Organization, 2021b). Effectively, at a basic level, an 'energy imbalance' repeated over a long period of time leads to weight gain and therefore risk of 'obesity' (Hill, 2012). It is important to note at this juncture, that there are many contributing factors outside this 'energy imbalance' description such as age, hormones and medication use that can influence weight gain. However, this research thesis does not investigate the chemical changes in the human body in relation to obesity as it is not the focus of this research. For the individuals not significantly affected by these influences, reducing weight, and therefore risk of obesity, can be achieved through 'energy balancing' behaviours over an extended period of time. This is predominantly achieved through calorie intake and expenditure manipulation, also known as a weight management strategy, or colloquially known as 'going on a diet'. It is important to acknowledge, that there are many weight management options that an individual can engage with, both within and outside general practice. Individuals can choose to engage with weight management strategies in one of three main ways: engaging with a commercial company who provides weight management programmes (such as Weight Watchers, or local Gym memberships) for a customer to 'follow'; self-designed weight management programme that includes a calorie reduction or exercise increase; or accessing weight management strategies through the healthcare system (public or private). In the western healthcare model, weight is linked to clinical markers of health and therefore general practice is the focus of this research.

Obesity Management in General Practice

Similar to the UK, America, Canada, and Australia (Moyer, 2012; National Health and Medical Research Council, 2013; National Institute for Health and Care Excellence (NICE), 2014; Obesity Canada, 2022), NZ positions weight management as a clinical health issue (Ministry of Health, 2017). The NZ Ministry of Health (MoH) has actioned several initiatives to reduce obesity through promoting improved nutrition and increased physical activity (including exercise prescriptions, 'Healthy Eating Healthy Action' plan, and 'Active Families'), as well as generating national guidelines for the management of health and obesity (such as implementing the 'National Healthy Food and

Drink Policy') (Mercer et al., 2013; Ministry of Health, 2022b). For example, there are the 'NZ Food and Nutrition Guidelines for Adolescents and Adults' that have been aligned with the WHO Global Action Plan on Physical activity (Ministry of Health, 2022b). These guidelines and programmes are not only aimed at effective weight management for reducing obesity rates through clinical interventions, they also can act as a prevention tool for obesity related comorbidities that risk developing. The NZ health system positions general practice as the best place to action these weight management guidelines and provides resources and intervention support for the healthcare professionals delivering this care (Ministry of Health, 2017).

In NZ, primary care health professionals and indigenous Māori health providers are positioned as 'best suited' to deliver obesity healthcare due to the frequency in which they see their clients over long periods of time in their role (Ministry of Health, 2017). The NZ MoH clinical weight management guidelines (CWMG) (Ministry of Health, 2017) align with the encouraged international approaches (Government UK, 2019; Moyer, 2012; National Health and Medical Research Council, 2013; Obesity Canada, 2022) that suggest primary care health professionals are in the most effective position to measure, monitor, advise, and intervene with weight, obesity management, and obesity health risks with their clients (Ministry of Health, 2017; National Health and Medical Research Council, 2013). Approximately 90% of all health consultations occur in primary care (National Health Service (Digital), n.d). Over 75% of NZ adults reportedly visited a GP in the 2021/22 Health Survey (Ministry of Health, n.d) with NZ clients averaging four to five visits to their GP or nurse each year (Ministry of Health, 2013). Healthcare professionals working in these general practice spaces are considered to be in a prime position to impact obesity rates through education, assessment and healthy lifestyle promotion (Government UK, 2019). There are many roles involved with the general practice space, such as nurse practitioners, primary care practice assistants, clinical pharmacists, health improvement practitioners, health coaches, community health workers, social workers, and physician associates (Pinnacle Incorporated, 2022). However, this research focuses on the initial point of contact for the key stakeholders in the general practice context: the GP, nurse or Māori health professional, and the individual (patient) seeking healthcare.

Body Mass Index Tool

The national recognition of obesity in NZ orientates around the western-centric health model whereby clinically, obesity is a tangible and measurable concept. In the NZ general practice context, obesity is predominantly measured using the Body Mass Index tool (BMI) which calculates the severity of obesity an individual embodies (Ministry of Health, 2022a). The BMI is calculated by dividing an individual's weight in kilograms, by the square of their height in metres (kg/m²) (World Health Organization, 2021a). An individual who is calculated to have a BMI of 25-30 is classed as overweight and >30 as obese (World Health Organization, 2021a). Due to the increasing obesity rates across the world, the BMI has been extended since its first inception to include subcategories, which indicate degrees of severity within the obese range. Class I obese is considered a BMI of 30-34.99; Class II obese is considered a BMI of 35- 39.99; and Class III obese is considered a BMI of >40. Having a high BMI (and therefore 'obesity') increases the risk of developing further health issues (Ministry of Health, 2022b). Whilst the BMI is considered a time effective option to measure the 'obesity level' of an individual, there are many who argue against its use as a generalisable tool. The BMI has been argued to have many inaccuracies such as: that it is an indirect measurement of body fat; fails to take into account muscle mass; fails to identify specific individual differences; weight is not an accurate representation of an individual's health; and is not generalisable to the population (Bhurosy & Jeewon, 2013; Prentice & Jebb, 2001; Rothman, 2008). The BMI does not differentiate

between fat and lean mass, nor any fat distribution on individuals and therefore can produce misleading results with athletes, certain ethnic groups, or age brackets (Adab et al., 2018; Lambert et al., 2012; Ministry of Health, 2018b). Ultimately, clinicians using the BMI should do so with caution when classifying an individual as obese. Whilst acknowledging the flaws of this measurement tool, this research thesis refers to obesity literature or obesity management as healthcare, with samples or individuals with obesity as per these BMI ranges (and without comorbidities), as this is the current tool predominantly used in literature and general practice which is the context of this research.

Client Benefit of Weight Management

Obesity is a complex health issue and can impact nearly all aspects of an individual's health, leading to an overall poor quality of life (Forhan & Gill, 2013; Ministry of Health, 2022b; Nigatu, 2016; Zhao et al., 2009). The health complications that stem from obesity can be avoided through effective weight management, which is one of the reasons why some individuals choose to engage with obesity healthcare (with other reasons including psychosocial, cultural or societal pressures). Obesity is recognised to increase the risk of individuals developing further health complications such as type 2 diabetes, stroke, cardiovascular diseases, osteoarthritis, some cancers or reproductive abnormalities, and can shorten life expectancy (Ministry of Health, 2022b). Physical activity becomes more difficult with obesity acting as a barrier (Ball et al., 2000) which has also been associated with dissatisfaction with quality of life in some research. Psychological and emotional health issues are also reported with obesity being associated with depression, anxiety, poor self-esteem, stress and body dissatisfaction (Abilés et al., 2010; Ministry of Health, 2022b; Nigatu, 2016; Zhao et al., 2009). Psychological distress has been suggested to be associated with obesity status (Wallace et al., 2016) whereby distress was higher for participants with Class II or III obesity prior to them losing weight and decreased below the clinical threshold when weight loss increased. Additional psychosocial changes have been reported to change through weight 'status' (Class II or III obesity, obesity, overweight, healthy weight) changes, such as self-concept, identity, social isolation, social re-insertion, social acceptance and perceived stigmatisation and discrimination (Brewis, 2010; Magdaleno et al., 2010; Young & Burrows, 2013). The decision to engage with weight management can be driven by many factors, each unique to the individual, however, an overall improvement of quality of life is a key beneficial outcome. Despite the weight management options available in general practice, and individuals choosing to access obesity healthcare, obesity rates in NZ have continued to rise. This indicates that there are potentially barriers experienced in this weight management space, or the efficacy of the available interventions is perhaps questionable.

Weight Management Interventions

Commercial Weight Management

It is important to note that there are many avenues for weight management strategies that an individual can choose to access, including commercial programmes, commercial gym memberships, internet-based programs, self-designed programmes and through general practice. Individuals wanting to address their weight will choose the weight management strategy that best suits them, which may include asking their primary care practice for help. However, weight management is a behaviour that can be actioned by individuals without the need of general practice, as there is a large commercial market offering weight management options to the general public. This commercial sector is colloquially labelled the 'diet industry' worth a reported \$41 billion USD globally in 2020 alone (Katharine de Costa, 2021), effectively 'selling' weight management to

consumers. However, this is an unregulated sector with extensive arguments around the efficacy of commercial programmes, the harm it perpetuates on vulnerable individuals and the ethical debates around unregulated 'health' advice (Ertin & Özaltay, 2011; Lustig, 1991; Ten Have et al., 2011). For individuals who do not wish to purchase or engage with a commercial programme, individuals can also create their own weight management strategy. This can be done through self-education and self-guiding their weight management programme through reputable sources such as the MoH (Ministry of Health, 2017, 2020). While the efficacy of the commercial and self-designed weight management sectors have been investigated in the past for primary care, (Ahern et al., 2011; Collins et al., 2013; N. Fuller et al., 2014; Gudzone et al., 2015; Jebb et al., 2011; Laudenslager et al., 2021) this is not the focus of this research thesis. Despite these debates, commercial and self-designed programmes are significant to the weight management experiences of participants in this research thesis and are therefore acknowledged. Weight management strategies offered in general practice is the context this research is situated in, which operates from a regulated healthcare system model.

Weight Management in General Practice

Weight management interventions in the general practice context may be initiated by clients or clinicians. Clients wanting to address their weight will choose an option that best suits them with the guidance of their general practice clinician. Within the NZ clinical general practice context, there are many weight management interventions available, most of which are set out in the CWMG document (Ministry of Health, 2017). A clinician is encouraged to start with developing a weight management plan with the client by providing nutritional advice on reducing total energy intake, modifying the types of food and drink consumed (for example swapping Coca-Cola for water) and improving the quality of fats and carbohydrates consumed (Ministry of Health, 2017). In addition, clinicians offer advice about increasing physical activity (joining gyms, social sport teams or solo exercise), joining commercial weight loss programmes (such as Weight Watchers for external support), getting good quality sleep, and ways to change behaviour towards more overall 'healthy' living (Ministry of Health, 2017). Specific weight management options available through general practice include low energy diets or very low energy diets (restricted calorie intake per day), diets that manipulate the macronutrient (fats, protein and carbohydrate) intake, dietitian referral (although this is restricted for those with comorbidities, not just for obesity alone), weight loss drugs (orlistat or phentermine), and, in some cases, referral for bariatric surgery (surgical weight loss) (Ministry of Health, 2017). It is acknowledged that injectable medications (used both on or off label), are prominent and gaining traction both internationally and within NZ as 'effective' weight management options for use in general practice at the time this thesis was written. However, these injectable medications were not available when this research was conducted and therefore not a focus in this research thesis. These options are recommended to be offered with consideration of their client's history, healthcare needs, as well as the sociocultural and socioeconomic contexts in which they live in (such as income level and their client's ability to afford weight management options) (Jull et al., 2011; Ministry of Health, 2017). Some options can be financially subsidised by the public health system, although some options have limited spaces available (such as bariatric surgery). However, there are opportunities for clients to self-fund their weight management strategies (commercial companies, weight loss drugs or bariatric surgery) privately (Gudzone et al., 2015; Laudenslager et al., 2021; Ministry of Health, 2017). Yet, in some bariatric cases, a GP approval is needed to access these private options. Regardless of the type of weight management program opted for by clients within or outside general practice, they all have some form of a calorie or energy deficit element which enables weight loss to occur (Hill, 2012).

Complexities of the Obesity Health Issue

Up until this point, this research thesis has highlighted the perspective of obesity and its management from a western health model context. However, there are many other significant perspectives of obesity that do not align solely with this western view. The range of perspectives of obesity and its status as a health 'risk' requiring 'treatment' are largely debated both within and outside the health system context. The range of views regarding obesity are important to understand as previous literature has indicated that a health issue cannot be viewed in isolation (World Health Organization, 2022). Whilst this research is based in the general practice context, it was anticipated that clients will come from a range of social realities and obesity perspectives. It is important to highlight the range of obesity views in this research thesis as they are significant to participant experiences with weight management and overall findings.

Obesity 'Epidemic' Debates

Reports of the 'high and rising obesity rates' (World Health Organization, 2021a) that have led to the labelling of the obesity health issue as an 'epidemic' have, in more recent years, been challenged by some social psychology researchers. Taking a critical perspective, Gard, Wright, and Campos, for example, are three researchers who dispute the integrity of the information that fuels the obesity 'epidemic' (Campos, 2013; Campos, 2004; Gard, 2011a, 2011b; Gard & Wright, 2005). They identify multiple misleading assumptions, distortions, inaccuracies and gross generalisations in the obesity scientific literature and shed light on how the reporting of the obesity 'evidence' makes it hard for anyone to make concrete conclusions in a confident manner (Lupton, 2013). Whilst these self-proclaimed 'obesity sceptics' are not arguing that an obesity problem does not exist, they importantly, and persuasively, critique and indicate the ways in which political agendas and pre-existing assumptions influence and shape the reporting and interpretation of medical and epidemiological data relating to obesity (Lupton, 2013). Despite these claims, 'obesity' is still largely constructed as an 'epidemic' in NZ and across the world (Ministry of Health, 2022b; World Health Organization, 2021a).

Sociocultural Views of Obesity

Obesity has different definitions in different contexts, demonstrating the many ways that the concept of 'obesity' is interpreted and the range of worldviews it embodies. Whilst obesity is predominantly perceived as a clinical health issue in the west, due to its ability to be 'measured' objectively, obesity can also be understood as a socially constructed phenomenon (Burr, 2015). In this case, obesity has different definitions in different sociocultural contexts. Similar to other western cultures, obesity in NZ is predominantly constructed as a negative health phenomenon with associations to constructs such as 'unhealthy', 'unattractive' and 'undesirable' (Boero, 2013; Brewis, 2010). A person with obesity is commonly assumed to be inferior, socially perceived by others to have 'let themselves go' or be stereotyped as someone who is too 'lazy' to lose weight (Brewis, 2010). In some cultures, the 'thin ideal' (a socially desirable body shape) is pervasively promoted to be something to aspire to (Couch et al., 2016; Donaghue & Clemitshaw, 2012; Hawkins et al., 2004), and those who are 'idolised' (such as celebrities, models, social media 'influencers', or sporting hero's) are rarely obese.

In contrast, there are cultures both within and outside of the western society that class 'obesity' as 'attractive', 'desirable' and an 'ideal' to aspire to by choice (Guinness World Record Limited, 2020). The association of 'obesity' with 'unattractive' is also being challenged, whereby pro-obesity websites, social groups, and human rights organisations have been established (National Association

to Advance Fat Acceptance, 2020). Additionally, the 'Fat Activism' movement works to change the anti-fat bias by raising awareness of the issues faced by 'fat people' including fat pride, fat empowerment and fat acceptance actions (Cooper, 2021; National Association to Advance Fat Acceptance, 2020; Pausé, 2020). Rejecting the historic Judeo-Christianity origins of obesity being associated with a lack of self-control (Lupton, 2013), some cultures position obesity as a sign of good health or wealth and an overall positive phenomenon or something to aspire to (Brewis et al., 1998; Haslam, 2007; Kruger et al., 2005; Ouldzeidoune et al., 2013; Pollock, 1995).

Regardless of the 'obesity' definition one subscribes to, obesity can impact negatively on an individual's health (Ministry of Health, 2022b). Whilst there are a range of perspectives that do not view obesity as a health risk (Campos, 2004; Gard, 2011a; Gard & Wright, 2005; National Association to Advance Fat Acceptance, 2020) and therefore, not requiring 'treatment', for the purposes of this research, obesity is positioned as a clinical health risk as set out by the WHO and Health NZ. This research acknowledges that obesity has multiple meanings in different sociocultural and historical contexts (Bell et al., 2017; Brewis, 2010; Haslam, 2007) and recognises the important debates around an individual's autonomy and level of paternalism exercised when it comes to obesity health (Buchanan, 2008, 2015; Hector, 2012; Skipper, 2012). Whilst there is a plethora of perspectives, views, and lived experiences of obesity, this research thesis does not investigate these debates or the depths of the definition or concept of 'obesity'. However, for the purposes of this research, 'obesity' is defined in alignment with the most recent WHO and Health NZ perspectives that obesity poses a significant risk to an individual's health. This research thesis focuses on individuals who are voluntarily choosing to engage with weight management to better their 'health', however this health is subjectively defined from their perspective. The focus of this research is not on the complexities of perspectives, but rather, operates from a presumption that obesity management is an issue for some and works in the context with people who are interested in obesity management.

Factors Influencing Obesity Management Efficacy in General Practice

Primary health clinicians who provide longitudinal care are positioned to be best suited to deliver obesity management care. However, obesity is an individualised health issue whereby the most effective 'intervention' is not the same for all. Clinicians are recommended to take into account any relevant obesity influencing factors when identifying suitable weight management options for their client to engage with (Ministry of Health, 2017). Whilst an energy imbalance cannot be denied as a key physiological contributor to obesity, there is significant literature that suggests this 'energy imbalance' is not an isolated contributor to obesity development. These factors are situated within and outside the scope of general practice making the role of a clinician more difficult for effective outcomes. These include physiological (genetic components) (Albuquerque et al., 2015), gender and hormonal changes throughout a lifespan (Lovejoy, 1998), behavioural and neurological perspectives such as food or eating 'addiction' (Corsica & Pelchat, 2010; Hebebrand et al., 2014; Pelchat, 2009; Volkow et al., 2013), environment factors (such as the obesogenic environment (Carter & Swinburn, 2004; Swinburn, 1999) or living in areas of high deprivation (Lake & Townshend, 2006; Oliver et al., 2015; Pearce et al., 2007; Siahpush et al., 2014), and social determinants of health (World Health Organization, 2022). In addition, psychological and social factors have been identified as influencing factors on obesity development, including experiences of trauma, emotional dysregulation, stress, depression, anxiety, unhappiness, negative stigmatisation and low self-esteem (British Psychological Society, 2019; Garaulet et al., 2012; Van Strien, 2018). In some psychosomatic theories, overeating has been described as momentary relief from stress, anxiety, or as a way for an individual to reduce discomfort (Bruch, 1974; Canetti et al., 2002). However, when this 'comfort eating' behaviour is

repeated over a long period of time, weight gain to the point of being clinically classed as obese can occur. In addition, clinician awareness about the perpetuating nature of obesity can be beneficial, whereby a client living with obesity can lead to depression or stigma, which can lead to further comfort eating and weight gain (Brewis, 2014).

Social stigma and discrimination have been reported to significantly contribute to obesity. Obesity is sometimes viewed as 'immoral' and socially unacceptable in western societies (Lupton, 2013) which operate with a western health model that clinicians work in. Consequently, those who are classed as having obesity are then 'blamed' for their obesity due to obesity being considered a (physiologically speaking) preventable and reversible health issue (World Health Organization, 2021b). This social 'blaming' of individuals has been reported to be experienced in the form of social isolation, personal and group discrimination, bullying and harassment on a daily basis (Carr & Friedman, 2005; Lewis et al., 2011; Magallares et al., 2016). Other literature suggests that the obese individuals are 'victims' of the obesogenic environment in which they live in, and turns the blame back onto the advertising and food industries as being responsible for obesity development through their use of psychological conditioning or unnatural food additives which cause an increase in cravings and fast-food consumption (Cordo, 2007; Harris et al., 2009; Mello et al., 2003). Regardless of the source of the social discrimination or obesity blame, the negative stigma and discrimination experiences have been argued to contribute to further anxiety, unhappiness and depression for individuals with obesity. This experience can again perpetuate the 'over-consumption of food' cycle and cause further weight gain and obesity comorbidity risk in some cases (Lewis et al., 2011; Magallares et al., 2016).

For indigenous cultures across the world, colonisation throughout history has been recognised as an additional contributory factor in health outcomes, including obesity (Moewaka Barnes & McCreanor, 2019; Paradies, 2016; Warbrick et al., 2019). Previous indigenous research indicates that factors such as racism, historical trauma, cultural sovereignty displacement and marginalisation negatively impacts the overall health and wellbeing of individuals (Maple-Brown & Hampton, 2020; Moewaka Barnes & McCreanor, 2019; Paradies, 2016; Warbrick et al., 2019). Indigenous Māori in NZ reportedly have high rates of obesity and experience health inequity (Ministry of Health, 2021b; Rahiri et al., 2020; World Health Organization, 2018). While this research thesis does not aim to investigate the discussions of colonisation impacts on obesity, it is acknowledged as significant to the obesity healthcare experiences for the participants who identify as indigenous Māori in this research thesis. The changes to the environment, political and sociocultural systems in which indigenous people live in can influence obesity development, and extend to non-indigenous populations as well. These are labelled as the social determinants of health by the WHO (World Health Organization, 2022).

The WHO highlights that there are many contributing factors to the obesity health issue, with the social determinants of health playing a significant role in the development of obesity across the world (World Health Organization, 2022). Social determinants of health include political/sociocultural systems in which people are born, live, grow, work and age in can all influence obesity development (Cassim et al., 2021; Swinburn, 1999; World Health Organization, 2022). This includes factors such as genetics, income, social/familial connections, employment status, access to affordable housing, healthy food, clean water availability, education levels, and political climates that can impact obesity development. For the obesity health issue, the cost of affordable housing, fresh 'healthy' whole foods, transport to exercise facilities, and therefore ability to navigate a 'healthy' lifestyle in an obesogenic environment are out of financial reach for many low-income families, with processed foods (that are high in sugar, carbohydrates and fat) being readily available

and pervasively marketed to those in lower socioeconomic areas (Jani et al., 2018; Mello et al., 2003; Pearce et al., 2007; Swinburn, 1999).

While this research does not engage in any debates or comment on the ways obesity can develop, or the wider political and social climate obesity is experienced in, it is important to include these concepts to better understand the range of lived experiences possible for the clients living with obesity in this research thesis. Clinicians are encouraged to manage obesity in their practice, however, with the range of obesity influencing factors highlighted, identifying which weight management is suitable for a client can become complicated. Whilst there are many recognised contributors to the obesity health issue, it is understood by WHO, Health NZ, and therefore this research thesis, that no contributing factor should be viewed in isolation. These factors can have a compounding effect, making the role of a clinician (and experience of a client) more difficult when trying to navigate an effective weight management journey.

Review of Literature

Rural Obesity Prevalence

Recent international literature has indicated that rural areas contribute to the obesity rates more than their urban counterparts (NCD Risk Factor Collaboration, 2019), yet little is known about the obesity health risk in the NZ rural population. There is no recent NZ rural-specific obesity prevalence statistic at the time of this research thesis. The most up-to-date rural measurement was from the most recent NZ health survey 20 years ago (2002-2003) (Triggs et al., 2007) which reported that rural females were more likely to be overweight or obese than urban females, while there was little difference between rural and urban males. However, despite there being no updated rural obesity prevalence figure, it is likely that these rates have increased as the most recent reporting in the 2020/21 national health survey identifies that the overall NZ obesity rate has increased from 31.2 to 34.3% in one year (Ministry of Health, 2021b). In addition, the lack of recent rural obesity prevalence information includes a lack of data on indigenous populations living rurally, who at a population level are reported to experience higher obesity rates (51%) than the average NZ rate (34%) (Ministry of Health, 2021b). This indicates a significant gap in knowledge about the current state of obesity healthcare in rural and indigenous rural populations requiring immediate attention for equitable health outcomes.

Rural Weight Management in General Practice

Obesity healthcare delivery is reported to differ between rural clinicians and their urban counterparts (Epling et al., 2011) suggesting barriers are different for rural and urban general practices. NZ has a significant rural population, with over 600,000 people living rurally (Rural Health Alliance Aotearoa New Zealand, 2019). Rural health is reportedly under-funded, under-resourced, under-staffed and operate at a disadvantage when compared with their urban counterparts. Rural general practice operates in similar ways to urban, however, rural areas reportedly experience more challenges with accessing primary healthcare than urban areas. A variety of factors, such as rural or remote geographical location, socioeconomic deprivation, lack of transport options, and telecommunication restrictions are reported to potentially impede individuals access to health and disability services rurally (National Health Committee, 2010). Rural general practice is often considered by local communities as a 'medical home' with a GP who is usually relied upon to be a skilled all-rounder who often thinks on their feet, does a lot with little resources and understands the needs of their local community (Royal New Zealand College of General Practitioners, 2023; Hauora Taiwhenua Rural Health Network, 2023). Rural general practices range from sole practitioner

practices to larger practices with multiple GPs, or a team including a nurse, allied health professionals, receptionists or local volunteers in some cases and are often located some geographical distance from additional services or hospitals.

Rural communities reportedly experience many healthcare inequities, including weight management intervention access (National Health Committee, 2010; Norman et al., 2022; Rural Health Alliance Aotearoa New Zealand, 2019). Rural disadvantages include lack of exercise facilities, the sometimes-isolated geographical location, high socioeconomic deprivation, lack of dietary commercial programmes and minimal service acceptability (National Health Committee, 2010). There are significant time, funding, staffing, training and resource constraints (Alsop-ten Hove, 2019; Davis-Wheaton, 2013; National Health Committee, 2010) which impact the ability of rural health professionals to deliver effective healthcare, indicating that there could be further barriers jeopardising the effectiveness of any weight management intervention in rural general practice. In addition, rural areas experience less employment opportunities leading to high deprivation, limited local food stores or exercise facilities (driving prices up for importing goods and minimizing competitive markets), and less (or no) access to private car or public transport to access the resources they need for good health and effective weight management (Davis-Wheaton, 2013; Doolan-Noble et al., 2019; National Health Committee, 2010). However, this knowledge is based on rural populations that do not represent the unique NZ population.

NZ has a significant rural and indigenous population which have received little attention in obesity research, despite being at high risk of developing obesity and, potentially, obesity comorbidities (Ministry of Health, 2022b). While general disadvantages and inequities are recognised for rural and indigenous populations, there is scarce information focused on obesity healthcare from the rural general practice sector. Effective healthcare for indigenous populations around the world includes the vital component of being culturally appropriate (Durie, 1997; Durie, 2003). Yet, there is limited understanding of obesity management in general practice from an indigenous Māori or rural worldview (Boulton et al., 2011; Davis-Wheaton, 2013; Davy et al., 2016). Some previous literature has identified barriers or areas of improvement for obesity related health risks in the secondary care sector (Boulton et al., 2011; Elley et al., 2008; Murphy et al., 2003), as well as the population health sector (Swinburn, 1999). However, little has been explored in the general practice sector and scarce investigation into rural specific general practice sector. The perspectives of both rural clinicians delivering obesity management and rural clients receiving this weight related healthcare are important to understand as minimal information is known at the time of this research thesis, despite obesity reportedly being a significant health risk.

Barriers to General Practice Obesity Management

Despite weight management interventions being offered through general practice, the obesity rates continue to increase, suggesting that there are barriers in this space to effective obesity healthcare. Each of the publications in this research thesis offer their own literature review relevant to their context and will not be repeated here. However, a brief overview of the barriers to effective obesity management in general practice literature is offered below.

Barriers from Clinician Perspectives

Previous literature has highlighted that effectively delivering weight management interventions has been challenging for clinicians (Glenister et al., 2017; Mazza et al., 2019). Perceived barriers to obesity healthcare in general practice for clinicians include ineffective communication tactics, discussion difficulties, obesity stigma, a normalisation of obesity in society and cultures, ineffective

or lack of referral options, perceived lack of motivation of clients to lose weight, a lack of clarity around the role of a clinician, social determinants of health, healthcare system limitations and a lack of culturally appropriate healthcare (Abbott et al., 2021; Bell et al., 2018; Blackburn et al., 2015; Eggleton et al., 2018; Glenister et al., 2017; Marmot, 2017; Mazza et al., 2019; Michie, 2007; Monsen et al., 2015; Nolan et al., 2012; Phillips et al., 2014; Sonntag et al., 2012; Swinburn, 1999; Van Dillen & Hiddink, 2014; Woodruff et al., 2016; World Health Organization, 2022). However, there are only a handful of studies that focus on the NZ general practice context, which found barriers similar to that of overseas clinicians (Claridge et al., 2014; Gray et al., 2018; Patel et al., 2011; Swinburn et al., 1997). A nurse-specific study included both urban and rural nurses and found that barriers included the desire to not offend their clients, a large range of professional perspectives about 'best practice' to discussing weight management, and a lack of clear effective messages for positive health changes (Phillips et al., 2014). NZ specific literature has looked at clinicians' views (Claridge et al., 2014; Gray et al., 2018), pharmacist perspectives (Gray et al., 2016), quality of obesity care in general practice (Naper et al., 2017), however, rural-specific literature is lacking.

Barriers to obesity healthcare from an indigenous worldview in general practice were scarce, however, not surprising as the western and indigenous worldviews of health differ significantly. Obesity related health programmes conducted with an indigenous Māori cultural worldview outside the general practice context have also identified barriers. These include the need to be psychologically ready for change and the challenge of weight loss, lack of time, lack of routine, the importance of relationships and support, lack of empowerment, and the need for an indigenous lead health improvement programme (Boulton et al., 2011; Eggleton et al., 2018; Forrest et al., 2016). Whilst this research thesis does not investigate in-depth the discussions around the differences between the western and indigenous worldviews of health, they are recognised as significant to the obesity healthcare experiences of the indigenous Māori participants in this research. The issues around providing western-centric healthcare to indigenous populations is linked to poor obesity related health outcomes (Bell et al., 2017) with a lack of Rongoa Māori included in mainstream NZ general practice acknowledged (Wikaire et al., 2018). However, for the purposes of this research, the voices of indigenous participants engaging with the western general practice healthcare context for obesity management is included while acknowledging the different cultural worldviews that can be lived. Regardless of which cultural worldview of health is subscribed to, there is still scarce understanding of the obesity healthcare perspectives of clinicians or Māori health providers in NZ literature which deserves attention.

Barriers from Client Perspectives

Previous literature from client perspectives has found that barriers are experienced with weight management in general practice. Clients identified barriers that include obesity stigma and discrimination, communication difficulties with their health professional, poor clinician/client relationships, differences in obesity perceptions or definitions, unhelpful advice or healthcare offered by their clinician, and other health issues taking priority over weight issues (Ananthakumar et al., 2020; F. Doolan-Noble et al., 2019; Howard et al., 2008; Johnson et al., 2014; Mazza et al., 2020; Russell & Carryer, 2013). NZ specific client perspective studies identified similar barriers experienced including communication difficulties, stigma, and unhelpful advice when seeking healthcare from their general practice clinician (Boulton et al., 2011; Dean et al., 2007; F. Doolan-Noble et al., 2019; Forrest et al., 2016; Russell & Carryer, 2013). However, only a handful of studies are from the client perspective in NZ and even less from a rural or an indigenous worldview, indicating a significant gap of awareness about the obesity health needs and perspectives from clients in general practice.

Synthesised Literature

It is important to understand both general practice clinician and client perspectives together to identify areas of improvement for general practice in its entirety. Previous international literature and urban general practice based literature has largely explored clinician and client perspectives in isolation. However, some studies have attempted to synthesise the views of both clinicians and clients. Barriers identified included clinicians and clients holding different definitions, experiences, and perceptions of 'obesity' (Johnson et al., 2014), communication difficulties, stigma experiences, as well as tensions around how best to 'treat' obesity or deliver weight management healthcare (Curgenvan, 2016; Henderson, 2015; McClinchy et al., 2011; Mold & Forbes, 2013; Ruelaz et al., 2007) in general practice. However, these studies predominantly operate using a single world view, such as the clinical definition, or the client's lived experience of obesity, as well as from either within or outside general practice context (Johnson et al., 2014). However, other research (Ogden et al., 2001) highlights the issues with this, whereby any interventions coming from this type of research will be difficult to be successful or effective as whatever intervention is generated, it will mean that either the clinician or client will be functioning outside their scope of worldview, and breakdowns could likely occur. It is important to understand both clinician and client experiences from their respective worldview in order to identify common ground to build foundations for effective obesity healthcare (Mold & Forbes, 2013).

Rationale Summary

Obesity in NZ is a significant health risk which may lower quality of life for individuals and contributes to an unsustainable strain on the national health system. While there are many different definitions, causes, and impacts of 'obesity', there are also weight management options available to prevent, treat, or reverse obesity. The most vulnerable populations in NZ including indigenous Māori, rural communities, and those living in high deprivation areas (Ministry of Health, 2021b) have scarcely received attention in NZ obesity research. Health NZ aligns with the WHO viewpoint which position obesity as a health risk and position obesity healthcare to be best suited for general practice to deliver (Ministry of Health, 2017). However, obesity and obesity related comorbidity rates are rising despite weight management interventions available through general practice. This indicates that there are potentially significant barriers to effective obesity management in this space.

Previous international literature highlights many barriers in the general practice context, including raising, discussing, and treating obesity, with rural areas also experiencing locality limitations and less referral or intervention opportunities. There is only a limited understanding of barriers faced by the clinicians and clients in rural NZ, despite having a unique NZ cultural make-up, including indigenous Māori. This thesis is positioned in rural Waikato general practice. The Waikato District Health Board has a population of over 425,000 and covers 21,000km², with 41% of the population residing in rural areas, and 23% of the population identifying as Māori (higher than the national average of 16%) (Te Whatu Ora Health New Zealand, 2023). Waikato has a large tertiary hospital, four small rural hospitals and 75 general practices (Te Whatu Ora Health New Zealand, 2023; University of Waikato, 2022) making this region suitable for exploratory obesity research.

Exploring and investigating the barriers to effective obesity healthcare in rural general practice is warranted to improve quality of life for individuals, communities, as well as support health professionals in this general practice context. Reviewing the obesity literature to date, and understanding the perspectives of clinicians and experiences of clients using obesity healthcare in rural general practice can assist with understanding any difficulties in this space. Identifying barriers

experienced and areas of obesity healthcare improvement, can inform best practice policy in the future to develop effective obesity healthcare for all NZ communities. Exploring and understanding these rural experiences can assist with advancing rural health, reduce inequities experienced, and look to reduce the long-term strain on the NZ national health system.

Purpose of Thesis (Aims)

It is expected that there are barriers to effective weight management in general practice given the previous literature indicating many layers to this health concern, specifically for high-risk populations. The overarching aim of this research thesis is: to explore the current general practice obesity interventions available in general practice, and to understand the barriers to, and experiences with obesity management in rural Waikato general practice from health care professional and client perspectives to assist in informing best practice for improving obesity healthcare in the future.

Specifically, this research sets out four areas:

- 1) What is already known about weight management in NZ general practice.
- 2) What are the perspectives of Waikato clinicians on obesity and weight management in their practice.
- 3) What are the perspectives and experiences of the other rural primary health care team members with weight management service delivery.
- 4) What are the experiences of rural clients who access weight management care in general practice.

Chapter 2: Methodology

Pragmatist Paradigm

This research embraces a pragmatist paradigm whereby it draws on the most suitable ontological, epistemological positions and methodological tools for the specific work at hand (Corbetta, 2003; Kuhn, 1962; Oxford Reference, 2022; Rossman & Wilson, 1985). While some of the studies conducted fit neatly under a positivist paradigm, others are more aligned to an interpretivist orientation. The choices made are premised on their utility for the particular research question being considered, as detailed below.

A pragmatic approach is also adopted in relation to the notion of 'obesity' itself. While there is a plethora of perspectives on obesity, for the purposes of this research thesis, obesity is recognised to have both an objective (Hill, 2012; Ministry of Health, 2022b; World Health Organization, 2021a) and subjective nature (Brewis, 2010; Campos, 2004; Gard & Wright, 2005). The justification for using different philosophical underpinnings and methodologies is to generate empirically sound findings for each of this research thesis' aims. It would be irresponsible, unethical, and inappropriate as a researcher to investigate a concept in a way that would not produce reputable findings.

Ontology

Ontology refers to a branch of philosophy that is concerned with the nature of reality and the study of the existence of phenomena (Hoffman & Kumar, 2020; Williams, 2016b). Scientific research, and social science research, operate with an ontological (or philosophical) worldview that guides all research in the field, whether consciously or unconsciously (Hoffman & Kumar, 2020; Williams, 2016b). This research uses two ontological standpoints. First, a positivist ontological standpoint considers there to be one 'reality' or 'truth' that is measurable, tangible and, overall, observable (Williams, 2016c). From this perspective, an objective social reality exists that is external to the individual and operates with the view that there is 'one truth' (Williams, 2016c). This 'truth' is measured objectively through empirical quantitative methods. In this research thesis, the positivist ontology relates to the clinical view of obesity, whereby obesity is a phenomenon that exists external to the individual, is observable, and is measured using the BMI tool.

Secondly, this research uses an anti-foundationalist ontological standpoint. An anti-foundationalist perspective considers that no knowledge can be certain nor can be provided with secure foundations in either pure experiences or reason (Bevir, 2010). This standpoint opposes the 'one absolute truth' and instead, considers there to be 'multiple truths' and realities (Curry, 2015; Tariq & Woodman, 2013) which can be socially constructed and interpreted (Burr, 2015; Corbetta, 2003). From this perspective, obesity is a subjective phenomenon and the definition of 'obesity' depends on the individual's personal experiences, which are different to others. For this research thesis, an anti-foundationalist perspective is utilised for the qualitative interviews, as previous literature has indicated there to be a vast range of experiences with the phenomenon of 'obesity' (Brewis, 2010; Campos, 2004; Gard & Wright, 2005; Lupton, 2013) demonstrating that there can be multiple versions of an obesity 'reality' or 'truth'.

Epistemology

Epistemology refers to the study of knowledge and how knowledge, or 'truth', is understood and examined (Cruickshank, 2020; Williams, 2016a). This research used two different epistemologies which is appropriate for the different aims of each of the studies that comprise this research thesis.

Firstly, a positivist epistemology is used. The positivist epistemology operates with the perspective that knowledge is attainable when the researcher and the study 'object' are independent, and that the researcher can study the phenomenon/object without influencing the object (objectivity) (Corbetta, 2003). For this research, the literature reviews and the quantitative GP survey study are underpinned with a positivist epistemology, as the researcher is positioned as independent of the object of study.

Secondly, in contrast to a positivist perspective, this research also uses an interpretivist epistemology. The interpretivist epistemological standpoint operates with the notion that social reality cannot be simply 'observed' and that it needs to be 'interpreted' (Corbetta, 2003; Lewis-Beck et al., 2004). In this way, an interpretivist view considers there to be multiple realities that can be explored, and rejects the idea of one single 'truth' (Bevir, 2010). This interpretivist epistemology operates from the assumption that individual's experience of a phenomenon (in this case 'obesity') is shaped by their history and the social realities they live in (such as social determinants of health, attitudes, cultural norms) which are different for everyone (Corbetta, 2003). This standpoint also identifies that research cannot be conducted independent from the researcher as the researcher's own worldview, unconscious views, and life experiences can potentially impact the interpretation of data (Corbetta, 2003). For this research thesis, the qualitative interviews with clinicians and clients operate with this interpretivist worldview as the researcher is not independent of the 'object' being studied due to the researcher actively participating in the research (through conversation in interviews and interpreting data from conscious and unconscious viewpoints). Every individual has different experiences with the phenomenon of 'obesity' making an interpretivist epistemology suitable for the qualitative studies in this research thesis.

Mixed Methods

A mixed method research design, in its most simple theoretical form, is the use of both quantitative and qualitative research methods in a single study or series of studies (Curry, 2015; Tariq & Woodman, 2013). While there are different types of mixed method designs, this research uses a 'mixed method explanatory sequential design' (Curry, 2015) which consists of two parts. The quantitative research is conducted first, followed by qualitative research, making up the 'sequential' part of this design (Ivankova et al., 2006; Tariq & Woodman, 2013). The qualitative section is used to further elaborate and detail the quantitative study, making up the 'explanatory' part of this design (Ivankova et al., 2006; Tariq & Woodman, 2013). The findings from the qualitative data, support and build upon the findings in the quantitative stage, and both together form a comprehensive view of the phenomenon studied (Curry, 2015; Ivankova et al., 2006; Tariq & Woodman, 2013). The qualitative component sets out to answer the 'why' or 'how' questions generated from the preceding quantitative research (Ivankova et al., 2006; Tariq & Woodman, 2013). For this research thesis, the first quantitative stage included reviewing the literature (chapters 3 and 4) and a quantitative survey of GPs (chapter 5). The second qualitative stage included the clinician and client interviews that explored the 'why' to the perspectives found in the GP survey in more depth (chapters 6-9) (Ivankova et al., 2006; Rossman & Wilson, 1985; Teddlie & Tashakkori, 2009).

Rationale for Mixed Methods

Mixed method design is argued to be the most appropriate as it is neither possible, nor desirable, to combine quantitative and qualitative methods in a study because they represent conflicting ways of collecting or viewing knowledge and the world (Curry, 2015; Ivankova et al., 2006; Tariq & Woodman, 2013). Although mixed method research has its challenges, as does any methodology,

this approach provides a wider range of tools for the researcher to use as opposed to using one design in isolation. While there are limitations to this method (such as the time-consuming nature and necessity of multi-disciplinary knowledge skills and expertise) there are also strengths (including providing opportunities for the exploration of quantitative findings in more detail to understand a phenomenon more comprehensively) (Curry, 2015; Ivankova et al., 2006; Tariq & Woodman, 2013). Using a mixed method approach enabled the ability to harness the strengths and off-set the weaknesses of both approaches, which is considered to be especially useful when addressing complex social and health phenomena, such as 'obesity' (Curry, 2015; Tariq & Woodman, 2013) and increase accuracy of any findings. Further, this research design generated a richer understanding of obesity healthcare experiences which could better inform best practice for general practice and improve health services, which was an aim of this research.

Theory

Theoretical perspective and understanding is important for any qualitative research. There a range of theoretical lens' that could be applied to the data derived from this research, especially as 'obesity' has both objective and subjective definitions in a range of contexts. Due to the variations of 'obesity' or 'weight' related experiences, multiple theoretical lens' were considered for use with this data. Specifically, Edmund Husserl's phenomenological approach, Erving Goffman's Stigma theory, and Henry Tajfel's Social Identity theory (Edmonds and Kennedy, 2017; Goffman, 1963; Tajfel and Turner, 1986) were key theoretical considerations. These theories were considered to be most relevant to what is known about the lived experience with obesity (through previous literature findings) and could be useful when analysing. However, this research as a whole, had both positivist and interpretivist approaches and aimed to explore more positivist 'barriers' as well as how participants made sense of their lived experiences with the phenomenon that is 'obesity'. While this research thesis could have theorised the data in a number of ways, it was decided in consultation with the wider research team to not overly theorise the data derived from this research, and therefore no specific theoretical lens was used. It is acknowledged that by applying a theoretical lens to this data the findings could be different, which this research thesis recommends for future research avenues.

Methods

This mixed method explanatory sequential research was conducted in three parts. Each study in this research thesis used the most suitable methods in line with the specific projects aims. These methods are detailed in the findings section in each manuscript (chapters 3-9) and will not be repeated here. However, a brief overview of the methods is offered below. Three studies made up this overall research project, each researched in a way that is empirically demonstrated to be best suited to each project's research aims.

Study 1: Literature Reviews

A comprehensive literature review was conducted to investigate this research thesis' first aim (to 'review the current literature of obesity management in NZ general practice'). Due to the subjective nature of obesity, and the variations of obesity focus areas within the articles found, it was decided to separate the reviews into one quantitative and one qualitative manuscript to ensure both perspectives were given adequate attention and no voices were lost or overrun by the other. The systematic review (chapter 3) embraced a positivist perspective and research process following the PRISMA guidelines (Moher D, 2009) and the meta-ethnography research process (chapter 4) (Noblit

& Hare, 1988) enabled the interpretivist perspective to be appropriately reviewed. Attempting to combine all data from both perspectives ran the risk of losing the essence of evidence from each perspective, and instead, when presented together, paint a far more comprehensive overview of the NZ obesity management situation than either could do when the findings were combined. These reviews identified that there was little knowledge on the obesity management in general practice in NZ, or in the Waikato region of NZ. This prompted a further exploration into the views of clinicians via survey (study 2, chapter 5).

Study 2: GP Survey

Due to limited literature on obesity healthcare, a cross-sectional exploratory questionnaire was conducted to collect information from GP's about their perspectives on obesity management in general practice from across the Waikato region of NZ. This quantitative survey design complimented this positivist ontological perspective and was determined to be most appropriate for achieving the aim of this study. This study (chapter 5) addressed aim number 2 of this research (to 'survey Waikato GP's to explore their perspectives of obesity healthcare in their practice'). This project used content analysis (Frey, 2018a), and descriptive statistics (Frey, 2018b), both of which are considered reliable and valid for this study design. With the small number of questions in the survey and small sample size impacted by Covid-19 restrictions, a short report was published to best reflect the findings in an empirical manner (chapter 5). This project identified that a deeper exploration was warranted into the views and experiences of obesity management from both clinician and client perspectives, which lead to study 3 (chapters 6-9).

Study 3: Interviews

This study addressed aims three (to 'understand, in-depth the perspectives of healthcare professionals working in rural general practice about their barriers to and experiences with treating obesity effectively') and four (to 'understand, in-depth the perspectives of rural Waikato general practice clients and their experiences with, and barriers to, effective weight management') of this research. This qualitative approach, from an anti-foundationalist and interpretivist perspective, used reflexive thematic analysis (RTA) (Braun & Clarke, 2021a). RTA has been identified to enable nuanced understandings of participants' experiences (Braun & Clarke, 2021a, 2021b). Semi-structured interviews were used to elicit the data from participants as this enabled the significant aspects of the participants' experience to be identified and interpreted (Adams, 2015). The details of analysis are highlighted in the method section of each particular study (chapter 6-9). Briefly however, they were all guided by RTA and utilised a six-step analysis process. This included i) familiarising oneself with the data (reading and re-reading interview transcripts), ii) coding (collecting all relevant concepts, iii) generating themes, iv) reviewing themes (with other researchers), v) defining and naming themes, and vi) writing up (Braun & Clarke, 2006). Whilst semi-structured interviews can be considered labour intensive and time-consuming they permit rich, contextualised narratives of lived experiences in a way that surveys do not (Adams, 2015) and were best suited for this project's research aims.

Obesity is experienced in a variety of ways with stigmatisation in wider social and political contexts influencing the experience individuals have with obesity healthcare (Brewis, 2014). Therefore, RTAs ability to understand the individual's experience and also interpret participants' positions within the wider social, cultural and political contexts (Braun & Clarke, 2021a) qualifies it for being the best suited for this part of the research thesis. RTA permitted a nuanced understanding of participants' experiences with obesity healthcare that is attuned to the ways experience is necessarily shaped by diverse socio-cultural and contextual matters. While homogenous samples of clinicians and clients are purposely targeted, it was expected that a range of truths, experiences and realities will be

present within and between these participant groups. With this understanding, the clinician interviews were split into two manuscripts so the views of GP's (chapter 6) and nurse's (chapter 7) could be given appropriate and comprehensive attention as the participants operate from different worldviews, professional roles and experiences when delivering obesity healthcare in their practice. In addition, the client interviews generated a wealth of knowledge and was split into two publications to ensure that the voices of participants' 'barriers' with obesity (chapter 8), and the 'experiences' with obesity healthcare in general practice (chapter 9) were not minimised.

Thesis Structure

The following 'Findings' Section of this research thesis consists of the seven publications generated from this research which are outlined below. All chapters have an overview paragraph of each manuscript for context.

Chapter 3: *Type:* Systematic Review.

Title: Adult obesity management in New Zealand general practice: a review.

Status: Published with Journal of Primary Health Care.

Reference: Norman, K., Chepulis, L., Burrows, L., & Lawrenson, R. (2021). Adult obesity management in New Zealand general practice: a review. *Journal of Primary Health Care*.

Chapter 4: *Type:* Meta-Ethnography Review.

Title: Barriers to obesity health care from GP and client perspectives in New Zealand general practice: A meta-ethnography review.

Status: Published with Obesity Reviews.

Reference: Norman, K., Chepulis, L., Burrows, L., & Lawrenson, R. (2022). Barriers to obesity health care from GP and client perspectives in New Zealand general practice: A meta-ethnography review. *Obesity Reviews*, 23(10), e13495.

Chapter 5: *Type:* GP Short Report.

Title: Waikato GP perspectives on obesity management in general practice: A short report.

Status: Published with Journal Primary Healthcare.

Reference: Norman, K., Chepulis, L., Campbell, F., Burrows, L., & Lawrenson, R. (2022). Waikato GP perspectives on obesity management in general practice: a short report. *Journal of Primary Health Care*.

Chapter 6: *Type:* Original Qualitative Research.

Title: Barriers to Obesity Healthcare in Rural General Practice from rural Waikato GP perspectives: a qualitative study.

Status: Published with Australian Journal of Rural Health.

Reference: Norman, K., Burrows, L., Chepulis, L., & Lawrenson, R. (2023). Barriers to obesity health care in general practice from rural Waikato GP perspectives: A qualitative study. *The Australian journal of rural health*, 31(4), 758–769. <https://doi.org/10.1111/ajr.13004>

Chapter 7: *Type:* Original Qualitative Research.

Title: "They're all individuals, none of them are on the same boat": Barriers to Weight Management in General Practice from the Rural Nurse Perspective

Status: Published with Primary Health Care Research and Development Journal.

Reference: Norman, K., Burrows, L., Chepulis, L., Mullins, H., & Lawrenson, R. (2023).

'They're all individuals, none of them are on the same boat': barriers to weight management in general practice from the rural nurse perspective. *Primary health care research & development*, 24, e50. <https://doi.org/10.1017/S1463423623000439>.

Chapter 8: *Type:* Original Qualitative Research.

Title: Sometimes choices are not made, because we have 'a' choice. They're made because they are 'the' choice": Barriers to weight management for clients in rural general practice.

Status: Published with BMC Primary Care.

Reference: Norman, K., Burrows, L., Chepulis, L., & Lawrenson, R. (2022). "Sometimes choices are not made, because we have 'a' choice, they're made because they are 'the' choice": Barriers to weight management for clients in rural general practice. *BMC Primary Care*, 23(1), 1-9.

Chapter 9: *Type:* Original Qualitative Research.

Title: Understanding Weight Management Experiences from Client Perspectives: Qualitative Exploration in General Practice.

Status: Published with BMC Primary Care.

Reference: Norman, K., Burrows, L., Chepulis, L. *et al.* Understanding weight management experiences from patient perspectives: qualitative exploration in general practice. *BMC Prim. Care* **24**, 45 (2023). <https://doi.org/10.1186/s12875-023-01998-7>.

Chapter 3: Systematic Review

Study 1: Quantitative Literature Review

Overview

This research thesis focus is on obesity healthcare interventions in general practice and the barriers to this healthcare delivery. To gain further understanding of obesity management in this space, it is important to explore the current methods and interventions that are currently available in this context. Particularly, the efficacy of these interventions is important to investigate before looking in-depth at the experiences of clinicians and clients to examine barriers.

Title: Adult obesity management in New Zealand general practice: a systematic review.

Authors: Kimberley Norman, Dr Lynne Chepulis, Prof Lisette Burrows, Prof Ross Lawrenson.

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Abstract

Introduction: Obesity is a significant health issue, which leads to further health complications, increases the strain on the national health system and lowers quality of life. There is scarce information available on obesity management to guide best practice in primary care, despite 32% of New Zealand (NZ) adults reported to be obese. **Aim:** To review obesity management in NZ general practice. **Methods:** A review on NZ adult obesity management in primary care was conducted. Six online databases were searched for peer-reviewed literature. Inclusion criteria was original research, a NZ adult sample aged 25-64 with BMI >30 (or include >25 BMI participants as well) with weight loss (kg) as a measurable outcome. **Results:** Eleven articles were included in this review. Nine studies reported statistically significant weight loss from baseline, and two studies reported no significant weight loss from baseline. Three studies used a Kaupapa Māori approach. This review found that there are effective weight loss interventions available for health professionals to refer to in the primary care context, however, they vary in strategy and suitability for individual patients. **Discussion:** Whilst the interventions did produce weight loss, the results ranged widely from 0.56kg to 12.1kg, suggesting that more comprehensive interventions are needed for patients, which include a combination of diet, exercise, behaviour modifications in culturally appropriate ways. Future research should aim to identify and mitigate potential barriers to obesity management in primary care, as well as develop comprehensive, multileveled interventions that are effective for the unique NZ population.

Keywords: Weight loss, obesity intervention, healthcare professionals, primary care, obesity healthcare.

What is already known: Obesity rates can be reduced through effective weight loss intervention strategies in general practice. However, minimal information is available to guide best practice for health professionals with obesity management in NZ.

What this research adds: This paper provides a synthesis review of what is known about obesity management in NZ primary care to assist with guiding best practice for health professionals in the effective management of obesity. This review provides evidence that can contribute to effective obesity healthcare delivery, improve patient's quality of life, as well as reduce NZ obesity rates and financial strain on national health system.

Introduction

Obesity is a significant health issue with New Zealand (NZ) recognised as having the third highest obesity rate behind America and Mexico (1). Currently 32% of NZ adults classed as obese (1). The most at-risk populations in NZ are those aged between 25-64, living in high deprivation areas and of Māori or Pasifika descent (2, 3). Importantly, obesity is a risk factor for several other conditions, including type 2 diabetes, cardiovascular disease, cancer and reproductive abnormalities (1). Obesity is a socially discriminated health issue and correlates with psychological disorders such as depression, anxiety, social isolation as well as identity changes (4-7). Obesity can also cause poor mobility, often because of joint strain, and collectively these comorbidities can lead to loss of employment and an overall lower quality of life (8-10). The healthcare costs attributable to obesity and excess weight were estimated to be \$624m in 2006 with this figure expected to increase (11). The high obesity and, therefore, high comorbidity rates, is causing significant economic strain on the NZ health system through increased costs of time, resources, healthcare demand, and a loss of productivity (11-13). This strain is not sustainable and obesity reduction measures are urgently required.

Reducing obesity rates in NZ is achieved through effective weight management intervention and prevention strategies (14). The Ministry of Health Clinical Weight Management Guidelines for adults (15) align with the encouraged international approaches (16-19), which suggest that primary care professionals are best positioned to measure, monitor, advise, and intervene with their patients' obesity risk (15, 18). The Ministry of Health advise that effective weight management is achieved through a combination of food control, physical activity increase and behavioural changes actioned in culturally appropriate ways (15), however, there are a multitude of psychosocial, cultural, environmental and economic factors that influence the effectiveness of these weight loss attempts (20-22). Whilst there are many options for people to attempt to autonomously manage their weight outside the primary care context (using commercial weight loss programmes such as Weight Watchers and Jenny Craig, self-determined low-calorie diets such as Ketogenic or Optifast meal replacements, available over the counter meals, increasing exercise, or self-funded medication), primary care has been tasked with the job of delivering care for those living with obesity (15). Weight management is connected to many other health issues that primary care professionals treat (such as diabetes) and therefore is an integral part of primary care, yet little is understood how best to deliver this care. Regardless of how individuals engage with weight management, obesity is recognised as a complex health issue (14) and there is little understood about effective interventions in NZ primary care.

There is minimal information about effective weight loss interventions, or best practice approaches, for the unique NZ population in primary care. There are quality overseas reviews that suggest a combination approach of healthcare professional counselling, meal replacements, commercial weight loss programmes or pharmacotherapy provides effective intervention (23-26), however, there is scarce literature on the NZ general practice setting. The purpose of this review is to find out what is known about obesity intervention in the NZ primary care context, and to report on the effectiveness of these studies. This review aims to identify knowledge gaps, evaluate the studies found, and shed light on a significant health issue facing individuals, family / whānau and the NZ national health system.

Methods

This review was conducted based on the protocol detailed in the Cochrane Collaboration handbook for systematic reviews for interventions (27). Due to the complex nature of obesity as a health risk, a stigmatized health condition, and a major public health issue, a review synthesis of quantitative literature was adapted to generate a comprehensive understanding of what is known about the management of obesity in primary healthcare in NZ. Obesity was defined in this review as the clinical measurement of a patient with a Body Mass Index (BMI) >30, however, overweight participants were not excluded (BMI >25) as they present a health risk (28).

Inclusion/ Exclusion criteria

Inclusion criterion was: original research focused on weight loss intervention in general practice; published in English language; with a NZ adult sample aged 25-64 with BMI >30 (or include >25 BMI participants as well); and have weight loss (kg) as a measurable primary (or secondary) outcome. Evaluations of weight loss programmes and interventions that also aimed to reduce comorbidities, such as HbA1c levels for diabetes, were included so long as a change in weight was also measured. Exclusions included studies that used institutionalised participants, those with mental illness, cancer or pregnant participants, family / whānau or child / adolescent focused interventions, post-menopausal women, older (>65) adults only, community-based only interventions, weight measurement not an outcome, digital/web-only interventions, protocols, or secondary care interventions.

Outcome measures

The primary outcome measure was difference in body weight (kg) before and after an intervention. Body weight could be either measured by healthcare professionals or self-reported. Studies were categorised into short (<12 months) and long term (>12 months), however, intervention times varied within each group.

Search Strategy

There were six major electronic databases searched for peer-reviewed papers in September 2020: Scopus, PubMed, Web of Science, Cochrane Reviews, APA Psych Net, and AlterNative between 2000-2020. Keywords used in the search strategy were variations of 'food', 'weight', 'diet', 'weight loss', 'general practice', 'primary care', 'general practitioner', 'obesity', 'overweight', 'BMI', 'New Zealand', and 'nurse'. AlterNative journal was included to elucidate quality research, give voice to minority groups, and generate a comprehensive review.

Results

A total of 198 studies were retrieved and screened against the inclusion criteria resulting in 22 full text articles. From this, 11 were identified for final inclusion in this review (Table 1) (29-39). The PRISMA flowchart in Figure 1 (40) shows the selection of these articles. Table 1 summarises the characteristics of the included studies. Table 2 summarises the intervention type, weight loss outcome and significance of results. Nine studies were found to have statistically significant weight loss from baseline, and 2 studies found no significant weight loss from baseline.

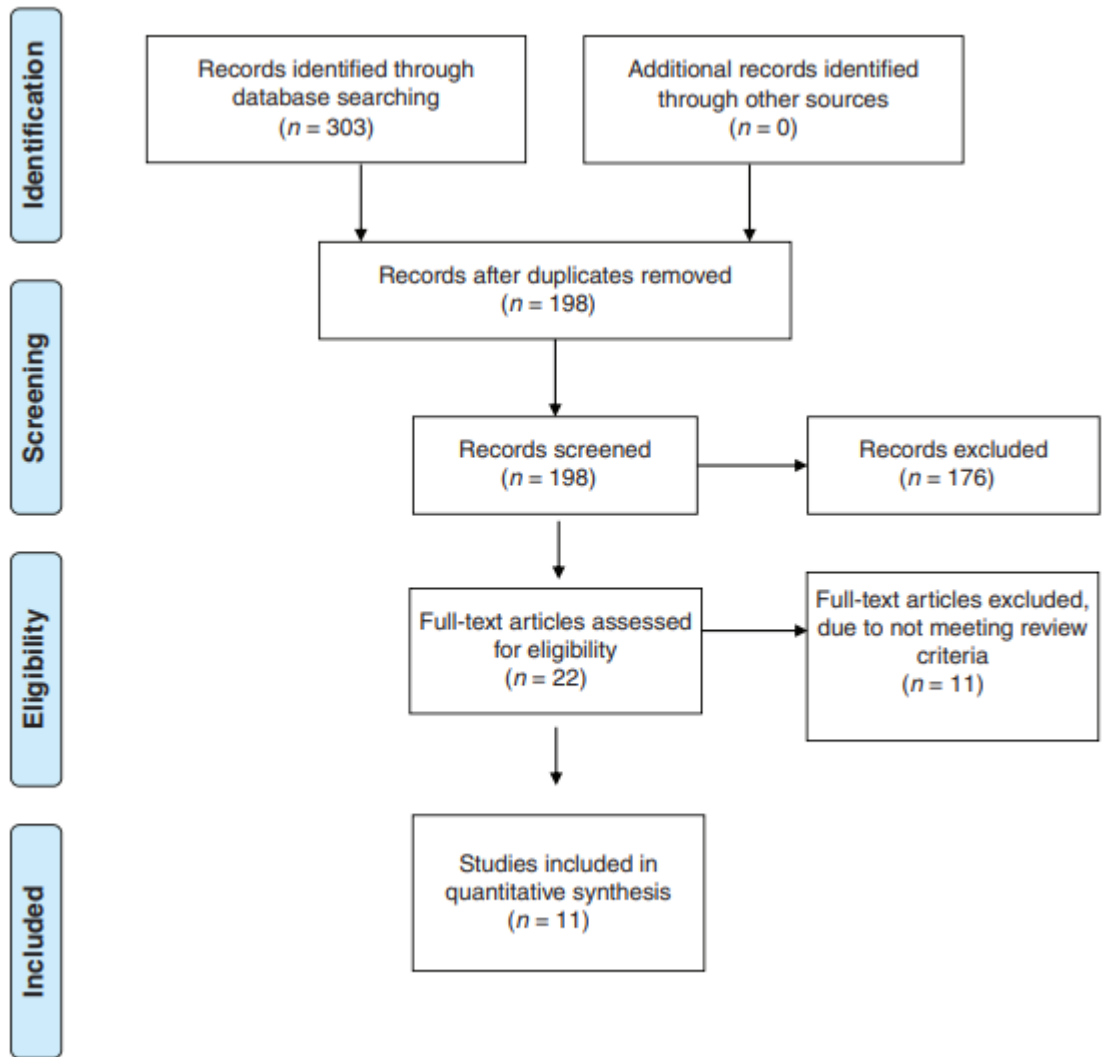


Figure 1: Figure 1. PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) flowchart showing selection of articles.

Table 1: General Characteristics and results of included studies

Publication (Year)	Goal of Intervention	Intervention (design, duration)	Length of Follow up	Number of Participants, recruitment, entry criteria	Characteristics of participants (gender, age)	Weight Loss Outcome Measure
Sellman et. al (2017)	To investigate if a psychosocial enhancement of Green Prescription enhances weight loss (and other outcomes)	Parallel two-group randomised controlled trial comparing Green Prescription plus Kia Ākina (psychosocial support) with Green Prescription alone for people with obesity	12 months	n=108 Recruitment: eligible participants were invited to participate through their general practitioner who had prescribed Green Prescription Eligibility: Body mass index >30	Age range 23-65 years 91 female, 17 male 74 NZ European, 13 Māori/ Pacific, 21 Other.	Both groups lost weight with a mean of 2.1kg for all participants. The psychosocial enhancement group lost more weight than the control group (3.6kg vs 0.7kg respectively)
Simmons et. al (2008)	To prevent the development of Type 2 diabetes through lifestyle change and weight loss.	A pilot study (Vanguard Study) cohort of 160 participants were weighed before and during Māori Community Health Worker lead lifestyle intervention	189 days mean	n= 160 Recruitment: through general practice invitations, media releases word of mouth through family / whānau and variety of health organisations. Eligibility: All members of any family including at least one Māori within same household were eligible.	Age: 47 (mean), 34.4% male, Māori participants	5.2 kg mean weight loss
Mhurchu et. al (2004)	To evaluate the efficacy of chitosan (medication) for	Randomised, double-blind, placebo-controlled trial, of	24 weeks	n=250 Recruitment: Newspaper advertisements	Age: 48 (mean) 82% women	0.56 kg (mean)

	weight loss in overweight and obese adults	chitosan effectiveness. Control group received placebo and intervention group received 3g chitosan/day. All participants received standardised dietary and lifestyle advice for weight loss.		Eligibility: Participants had to be overweight or obese adults and not be part of any other clinical trial.	No Ethnic data collected	
Coppell et. al (2017)	To examine the implementation and feasibility of a multilevel primary care nurse-led prediabetes lifestyle intervention compared with current practice on weight and glycated haemoglobin in patients with prediabetes.	Convergent mixed methods design involving a 6-month pragmatic non-randomised pilot study with a qualitative process evaluation. Control group received normal care and intervention group received primary care nurse, nutrition advice, social support meetings and follow ups	6 months	n=157 Recruitment: Eligible participants identified from practice records and invited to participate via letter. Eligibility: Aged <70 years, with newly diagnosed prediabetes, and Body mass index >25.	Age: <70 years 47.8% female 31.2% Māori	After adjustment for baseline measures the intervention group lost a mean 1.3 kg more than the control
Wright et. al (2017)	To investigate the effectiveness of a community-based Whole Food- Plant Based dietary programme in a	Prospective, two-arm, parallel, superiority RCT Both groups received standard medical care. Intervention	6 months	n= 65 Recruitment: Invitations via letters to eligible participants from a general practice. Eligibility: diagnosed with obesity or overweight and at least one of type 2	Aged 35 – 70 years 39 female, 26 male 51 NZ European, 8 Māori, 6 Other	Both groups lost weight, the intervention group lost more than the

	population of New Zealander's.	group additionally attended facilitated meetings twice-weekly for 12 weeks, and followed a non-energy-restricted diet with vitamin B12 supplementation.		diabetes, ischaemic heart disease, hypertension or hypercholesterolaemia.		control group (12.1kg vs 2.8kg respectively) with a mean difference between groups of 10.6kg
Cutler et. al (2010)	To evaluate the outcomes of Appetite for Life, a primary care-based healthy lifestyle programme for women who are overweight to achieve long-term health gain through behaviour changes.	Cohort study design Intervention included weekly group educational sessions delivered by trained practice nurse facilitators, which included social support.	12 months	n= 261 Recruitment: Through general practices, newspaper advertisement and word of mouth. Eligibility: Overweight/ obese women were eligible	Age: 48 (median) Women only 9.7% Māori, 0.4% Pacific and remainder either as New Zealand European or New Zealander.	No mean weight loss. Mean weight was maintained.
Williams et. al, (2017)	To compare the uptake and effectiveness of two modes of Green Prescription delivery: face-to-face and telephone among both Māori and New Zealand Europeans.	RCT, open label design with Kaupapa Māori approach. Both groups received Green Prescription exercise programme, one via telephone, and the other via face-to-face.	6 months	n=138. Recruitment: Participants were identified through general practitioner or practice nurses and invited to participate Eligibility: diagnosed with type 2 diabetes and prescribed Green Prescription.	Age: 30-86 years 52 male / 86 female 68 Māori, 70 NZ European.	Both groups lost weight, for all participants there was a 1.8kg mean weight loss
Mcauley et. al (2003)	To evaluate a lifestyle intervention	Cohort study before and after lifestyle intervention	4 months	n=31 Recruitment: 'Snow balling' technique / word of mouth.	Age: 41.3 (mean) 28 female/ 8 male	Mean weight loss of 3.1kg

	programme aimed at reducing type 2 diabetes, which is acceptable to Māori and which has objective outcome measures to determine the effectiveness of the programme.	programme. Diets were individually prescribed and based on each participant's usual intake or an energy level designed to lead to gradual and sustained weight reduction.		Eligibility: at least one member of their family / whānau diagnosed with type 2 diabetes	All identified as Māori	
Krebs et. al, (2012)	To compare the effectiveness of low-fat high-protein and low-fat high-carbohydrate dietary advice on weight loss, using group-based interventions, among overweight people with type 2 diabetes.	Multicentre parallel (1:1) design, blinded randomised controlled trial. Participants received intervention of either low-fat high-protein diet or low-fat high-carbohydrate diet and attended 18 group sessions over 12 months.	12 months	n=419 Recruitment: Letter invitations through primary or secondary care and community/ media advertisements Eligibility: diagnosed with type 2 diabetes, aged 30-76 and Body mass index >27	Age : 57.9 (mean) 168 male / 251 female 352 NZ European, 41 Māori, 14 Pacific, 21 Other	Both intervention groups produced between 2-3kg of weight loss
Forrest et. al (2016)	To evaluate the effectiveness of the fat loss intervention in Māori "The PATU Aotearoa Hinu Wero (Fat Challenge) - a group exercise initiative that promotes physical activity and focuses on fat loss	Mixed-method study for evaluation: explanatory sequential design with Kaupapa Māori approach. Cohort group attended as many 30-40 minute HIIT gym sessions as they wanted per week facilitated by	9 weeks	n=66 Recruitment: Verbal invitations, word of mouth, Tikanga Māori (protocols) were implemented, including appropriate ngā mihi (introductions) and a collective koha (gift) provided to the PATU gym. The latter was provided at the request of the participants in place of individual koha. All verbal and written exchanges between researchers and	Age: 17-63 years old 26 males, 46 females Māori	Weight loss of 4.3kg mean for those that completed final weigh in (33%)

	in order to reduce obesity in Māori	qualified instructors, and could attend nutritional workshops. A prize was available for the one who lost the most weight as incentive.		participants were offered in te reo Māori as well as in English.		
Eggleton, Stewart, & Kask (2018)	To investigate the effectiveness of Kaupapa Māori fitness and exercise programme that aimed to assist mainly Māori adults, to lose weight.	Cohort study with a Kaupapa Māori approach. Intervention was participation in a 1 hour exercise session at least 3x per week. Exercise was a Muay Thai kickboxing exercise programme that was developed with community involvement.	100 days (participants followed for at least 3 months)	n=93 Recruitment: Through the Ki A Ora Ngātiwai clinical team and word of mouth in community Eligibility: Participants were not involved in any other exercise or gym programmes.	Age: 20-49 years 74 were female 89 were Māori	5.2kg mean weight loss per 100 days

Table 2: Summarised results from included studies

Publication	Intervention Type	Diabetes Factor	Weight Loss (mean)	P value
Sellman et. al (2017)	Exercise, behaviour change	No	2.1kg	p= 0.03
Simmons et. al (2008)	Kaupapa Māori, behavioural changes, education, exercise	Yes	5.2 kg	p < 0.001
Mhurchu et. al (2004)	Medication	No	0.56kg	p =0.003
Coppell et. al (2017)	Diet changes, social support	Yes	1.3 kg	p < 0.001
Wright et. al (2017)	Diet changes	Yes	10.6kg	p < 0.0001
Cutler et. al (2010)	Lifestyle behavioural changes	No	No mean weight change	p = 0.09
Williams et. al, (2017)	Exercise, social support	Yes	1.8kg	p= 0.03
Mcauley et. al (2003)	Diet and exercise changes	Yes	3.1kg	p= 0.000
Krebs et. al, (2012)	Diet changes	Yes	2-3kg	p <0.001
Forrest et. al (2016)	Kaupapa Māori, Exercise	No	4.3kg	p <0.001
Eggleton, Stewart, & Kask (2018)	Kaupapa Māori, Exercise	No	5.2kg	p <0.001

Interventions with Statistically Significant Weight Loss Achieved

Nine studies produced statistically significant weight loss with their respective intervention time frames. Two studies included a change in diet only (33, 37), 1 used diet changes and social support (32), 1 used diet and exercise changes (36), 1 used exercise and behavioural changes (29), 3 Māori approaches used exercise (35, 38, 39) and 1 included a Māori approach with behavioural changes, food education and exercise (30).

The interventions that involved more than one weight management component (food, exercise, behavioural changes and culturally appropriate changes) all produced statistically significant weight loss results. The only interventions with an isolated component for weight loss that produced significant results was the changes in diet (33, 37).

For Māori, in addition to the exercise, nutrition workshops and behavioural changes (35, 38, 39), there was a strong cultural component (30) which contributed to the statistically significant weight loss each intervention produced. The inclusion of whānau (30, 39) and values such as whanaungatanga (support/ connectedness) (38), pātaka mātauranga (sharing knowledge that leads to understanding and responsibility) and manaakitanga (enhancing the integrity of the person) (35) was integral to the weight loss achievements within these interventions.

Of the included studies in this review, 4 were RCT's, 3 were cohort designs, 1 was convergent mixed methods, and 3 were Kaupapa Māori design. Six of the eleven studies included a diabetes component to their research. Weight loss ranged from no mean change (34) to 10.6kg mean (33). The intervention timeframe and weight loss measurements from baseline ranged from 9 weeks to 12 months. Three of these studies were long term (measurements taken at baseline and at or over 12 months) and 7 were short term (<12 months).

Six of the eleven studies included a diabetes sample or focus and all produced significant weight loss. Three studies focused solely on patients with diabetes (30, 35, 37), one on patients with prediabetes (32), and two with aims to reduce diabetes or heart disease within their samples (33, 36).

Interventions achieving no significant weight loss

Two studies produced statistically insignificant weight loss with their respective timeframes with one RCT using a medication only intervention (31) and one cohort study using lifestyle behaviour changes only (34). Neither of these two studies has a diabetes factor included in their design.

Discussion

This review of weight loss interventions in primary care among NZ adults identified only 11 studies, with very heterogeneous study methodologies and mixed results. This review found that there are effective weight loss interventions available for patients in the primary care context, however, they vary in strategy and suitability for individual patients. The options being used include unique combinations of diet, exercise, behavioural changes in culturally appropriate ways which align with the Ministry of Health best practice (15). A survey done by Elliot and Hamlin determined that the odds of losing weight were higher if patients changed both diet and exercise behaviours (17.5) as opposed to only physical activity (5.2) or only diet (7.2) and culturally appropriate interventions are vital for Māori and Pasifika populations (41). Yet, none of these studies included all three (or four for specific culturally tailored interventions) components in their weight loss interventions. Whilst the interventions did produce weight loss, the results ranged widely from 0.56kg to 12.1kg with variable follow up times, providing less certainty that the findings are sustainable. These findings suggest that

more comprehensive approach is needed which includes a combination of diet, exercise, and behaviour modifications conducted in culturally appropriate ways.

It was unsurprising to find that 6 of the studies in this review used patients with a diabetes diagnosis (an obesity comorbidity) as weight loss can reduce comorbidity risks (42). The weight loss results from these studies varied considerably (1.3kg (32) to 12.1kg (33)) and highlights further difficulties to the weight loss process with the addition of controlling blood sugar levels as well. This suggests that weight gain prevention (and therefore diabetes prevention) could be more effective as an intervention due to the more achievable nature of weight management at a less severe obesity level. When investigating the management and referral of obesity healthcare in a NZ general practice, one study found that whilst obesity risk factors were being managed appropriately by the general practitioner (as per Ministry of Health guidelines), earlier identification and referral of high-risk patients could improve obesity health outcomes (43) and essentially act as an obesity prevention tactic. Potentially, effective interventions producing greater weight loss results could be better positioned at the time of a patient's excess weight gain or identification of a high health risk, but before the development of a comorbidity. This could enable individuals to reach weight loss and health goals faster and reduce the additional strain on the health system. Further research is needed to determine the effectiveness of prevention as intervention for obesity and comorbidities at this juncture of the patients' health.

The small number and limited scope of NZ studies found for this review is somewhat surprising given the high obesity rates in NZ (2), suggesting that there are potential barriers to weight loss in this primary care context. Obesity is a complex social, environmental, cultural and psychological health issue (1, 20, 22) that also carries stigma and discrimination in every aspect of life (44). Previous studies have identified barriers including ineffective conversational strategies, patient's readiness to change, system limitations and discrepancies of the general practice role in obesity management (45-48). Some patients have beliefs that align with pro-obesity, believe that obesity is not a health concern for them, or are unaware they are classified as obese therefore making intervention unwarranted (49, 50). These opposing views make obesity management a delicate and complicated issue for health professionals to deal with in their practice, as obesity is a significant issue both within and outside the general practice setting. One study identified barriers to be lack of accessibility to effective interventions for their patients (including culturally appropriate interventions), stigma associated with obesity, and a lack of training, support or resources around best practice (46). These barriers could explain the lack of reduction in obesity rates in recent years, however, further investigation is needed to identify and mitigate barriers to obesity healthcare and generate support for primary care professionals who are tasked with providing this care effectively.

Primary care professionals are positioned as responsible for intervening with obesity health concerns (15), yet there is limited information available to inform 'best practice' for such an individualised and complex health issue. Studies from overseas samples have found that medications (25) very low energy diets and meal replacements (51-53) commercial weight loss programmes (26, 54) and dietitian referral (55) interventions produce positive weight loss outcomes, however, they also support the necessity for a multileveled intervention approach (23, 56). Previous NZ research is available for healthcare professionals to refer to, however, the focus is primarily on children, adolescents, older adults or secondary care (57-60) and does not directly assist with healthcare professionals best practice options for clients outside these samples. Culturally appropriate interventions for high-risk populations including Māori and Pasifika are available to be referred to by healthcare professionals, however, these interventions are predominantly actioned at the community or family/ whānau level and not primary care (61, 62). One recent study used a

partnership methodology of an academic university team and a Māori community health provider who co-designed a lifestyle intervention programme with Māori men and stakeholders of a community (63). Whilst this methodology utilised a community-based participatory approach, the intervention was not based in the general practice (or clinical) context, and therefore the role of general practice became murky and more difficult. Until more definitive NZ literature is produced, it is reasonable for health professionals to use a combination of weight loss evidence from international samples, NZ based evidence, and the Ministry of Health guidelines (15) to guide their practice. Using this available literature is recommended in conjunction with professional medical advice and tailoring to specific patient needs (including medical, cultural and psychosocial needs) for effective obesity healthcare delivery.

Like any review, this review is subject to publication bias and time lag. Further limitations were the inclusion of English language only, exclusion of grey literature and secondary care articles, along with interventions that had no weight loss outcome measurement. General methodological problems including participant dropout rates, how many participants complied with interventions, and self-report bias could potentially skew the reported effectiveness of these interventions. The statistically significant weight loss found in 9 out of 11 studies was only measured to the respective timeframe of each study and not checked beyond this for sustainability of effectiveness. Furthermore, diabetes intervention literature was not purposely searched for, however, due to the integrated nature of diabetes and obesity some diabetes studies with weight loss measurements came up in the searches. Whilst including diabetes specific research could generate more studies, the aim of this review was to understand primary care interventions about NZ adult population without comorbidities, and therefore diabetes databases were not included.

In conclusion, the current evidence of effective primary care weight loss interventions in a NZ setting is limited and based on a small number of studies. Nine out of the eleven studies achieved significant weight loss from their respective interventions, showing promise, however, weight loss not measured for sustainability long term. The Kaupapa Māori studies achieved similarly significant weight loss results demonstrating that the inclusion of a cultural component is effective and important for these populations. However, the current amount of literature is too small to draw firm conclusions as there is too much heterogeneity in participant populations, theoretical perspectives, and study designs. Primary care professionals should draw upon the combination approach of dietary, exercise, and behavioural changes (FAB) for effective obesity interventions in their practice. Until more research is done in the NZ setting, primary care professionals are recommended to utilise the international evidence for effective weight loss interventions, whilst also including tailored health advice that takes into account the medical, cultural and psychosocial needs of the individual patient. Further research is needed to identify barriers influencing the effectiveness of primary care obesity interventions in NZ to improve health outcomes, reduce the strain of obesity on the national health system, and disassociate the obesity health crisis with NZ.

References

1. Ministry of Health. Obesity. Wellington: Ministry of Health; 2020. [cited 2021 March 31]. Available from: <https://www.health.govt.nz/our-work/diseases-and-conditions/obesity>.
2. Ministry of Health. Obesity Statistics. Wellington: Ministry of Health; 2020. [cited 2021 March 31]. Available from: <https://www.health.govt.nz/nz-health-statistics/health-statistics-and-data-sets/obesity-statistics>.
3. Zhao G, Ford ES, Dhingra S, et al. Depression and anxiety among US adults: associations with body mass index. *Int J Obes*. 2009;33(2):257–66. doi:10.1038/ijo.2008.268
4. Abilés V, Rodríguez-Ruiz S, Abilés J, et al. Psychological characteristics of morbidly obese candidates for bariatric surgery. *Obes Surg*. 2010;20(2):161–7. doi:10.1007/s11695-008-9726-1
5. Magdaleno R, Chaim EA, Turato ER. Understanding the life experiences of Brazilian women after bariatric surgery: a qualitative study. *Obes Surg*. 2010;20(8):1086–9. doi:10.1007/s11695-008-9697-2
6. Young J, Burrows L. Finding the ‘self’ after weight loss surgery: two women’s experiences. *Fem Psychol*. 2013;23(4):498–516. doi:10.1177/0959353513500471
7. Goettler A, Grosse A, Sonntag D. Productivity loss due to overweight and obesity: a systematic review of indirect costs. *BMJ Open*. 2017;7(10):e014632. doi:10.1136/bmjopen-2016-014632
8. Nigatu YT, Reijneveld SA, de Jonge P, et al. The combined effects of obesity, abdominal obesity and major depression/ anxiety on health-related quality of life: the lifelines cohort study. *PLoS One*. 2016;11(2):e0148871. doi:10.1371/journal.pone.0148871
9. Forhan M, Gill SV. Obesity, functional mobility and quality of life. *Best Pract Res Clin Endocrinol Metab*. 2013;27(2):129–37. doi:10.1016/j.beem.2013.01.003
10. Lal A, Moodie M, Ashton T, et al. Health care and lost productivity costs of overweight and obesity in New Zealand. *Aust N Z J Public Health*. 2012;36(6):550–6. doi:10.1111/j.1753-6405.2012.00931.x

11. Clough P, Destremau K. The wider economic and social costs of obesity: a discussion of the non-health impacts of obesity in New Zealand. Wellington: New Zealand Institute of Economic Research; 2015.
12. Wang YC, McPherson K, Marsh T, et al. Health and economic burden of the projected obesity trends in the USA and the UK. *Lancet*. 2011;378(9793):815–25. doi:10.1016/S0140- 6736(11)60814-3
13. World Health Organization. Obesity. Geneva: World Health Organization; 2021. [cited 2021 March 31]. Available from: <https://www.who.int/topics/obesity/en/>.
14. Ministry of Health. Clinical Guidelines for Weight Management in New Zealand Adults. Wellington: Ministry of Health; 2017. [cited 2021 March 31]. Available from: <https://www.health.govt.nz/publication/clinical-guidelines-weight-management-new-zealand-adults>.
15. National Institute for Health and Care Excellence (NICE). Weight management: lifestyle services for overweight or obese adults. 2014. [cited 2021 March 31]. Available from: <https://www.nice.org.uk/guidance/ph53>.
16. Moyer VA. Screening for and management of obesity in adults: US Preventive Services Task Force recommendation statement. *Ann Intern Med*. 2012;157(5):373–8. doi:10.7326/ 0003-4819-157-5-201209040-00475
17. National Health and Medical Research Council. Clinical Practice Guidelines for the management of overweight and obesity in adults, adolescents and children in Australia. Canberra: Australian Government; 2013. [cited 2021 March 31]. Available from: <https://www.nhmrc.gov.au/about-us/publications/clinical-practice-guidelines-management-overweight-and-obesity>.
18. UK Government. Adult obesity: applying all our health. London: Public Health England; 2019. [cited 2021 March 31]. Available from: <https://www.gov.uk/government/publications/adult-obesity-applying-all-our-health/adult-obesity-applying-all-our-health>.
19. Swinburn B, Egger G, Raza F. Dissecting obesogenic environments: the development and application of a framework for identifying and prioritizing environmental interventions for obesity. *Prev Med*. 1999;29(6):563–70. doi:10.1006/pmed.1999.0585

20. British Psychological Society. Psychological perspectives on obesity: addressing policy, practice and research priorities. Leicester: British Psychological Society; 2019. [cited 2021 March 31]. Available from: <https://www.bps.org.uk/sites/bps.org.uk/files/Policy/Policy-Files/Psychological>.
21. Siahpush M, Huang TTK, Sikora A, Tibbits M, Shaikh RA, Singh GK. Prolonged financial stress predicts subsequent obesity: results from a prospective study of an Australian national sample. *Obesity*. 2014;22(2):616–21. doi:10.1002/oby.20572
22. Tsai AG, Wadden TA. Treatment of obesity in primary care practice in the United States: a systematic review. *J Gen Intern Med*. 2009;24(9):1073–9. doi:10.1007/s11606-009-1042-5
23. Yoong SL, Carey M, Sanson-Fisher R, Grady A. A systematic review of behavioural weight-loss interventions involving primary-care physicians in overweight and obese primary-care patients (1999–2011). *Public Health Nutr*. 2013;16(11):2083–99. doi:10.1017/S1368980012004375
24. Yanovski SZ, Yanovski JA. Long-term drug treatment for obesity: a systematic and clinical review. *JAMA*. 2014;311(1):74–86. doi:10.1001/jama.2013.281361
25. Gudzone KA, Doshi RS, Mehta AK, et al. Efficacy of commercial weight-loss programs: an updated systematic review. *Ann Intern Med*. 2015;162(7):501–12. doi:10.7326/M14-2238
26. van Tulder M, Furlan A, Bombardier C, Bouter L, Editorial Board of the Cochrane Collaboration Back Review Group. Updated method guidelines for systematic reviews in the Cochrane Collaboration Back Review Group. *Spine*. 2003;28(12):1290–9. doi:10.1097/01.BRS.0000065484.95996.AF
27. Ministry of Health. Measuring Weight. Wellington: Ministry of Health; 2018. [cited 2021 March 31]. Available from: <https://www.health.govt.nz/your-health/healthy-living/food-activityand-sleep/healthy-weight/measuring-weight>.
28. Sellman D, Schroder R, Deering D, et al. Psychosocial enhancement of the Green Prescription for obesity recovery: a randomised controlled trial. *N Z Med J*. 2017;130(1450): 44–54.
29. Simmons D, Rush E, Crook N. Te Wai o Rona: Diabetes Prevention Strategy Team. Development and piloting of a community health worker-based intervention for the prevention of diabetes among New Zealand Māori in Te Wai o Rona: Diabetes

- Prevention Strategy. *Public Health Nutr.* 2008;11(12):1318–25.
doi:10.1017/S1368980008002711
30. Mhurchu CN, Poppitt SD, McGill AT, et al. The effect of the dietary supplement, Chitosan, on body weight: a randomised controlled trial in 250 overweight and obese adults. *Int J Obes.* 2004;28(9):1149–56. doi:10.1038/sj.ijo.0802693
 31. Coppell KJ, Abel SL, Freer T, et al. The effectiveness of a primary care nursing-led dietary intervention for prediabetes: a mixed methods pilot study. *BMC Fam Pract.* 2017;18(1):106. doi:10.1186/s12875-017-0671-8
 32. Wright N, Wilson L, Smith M, et al. The BROAD study: A randomised controlled trial using a whole food plant-based diet in the community for obesity, ischaemic heart disease or diabetes. *Nutr Diabetes* 2017;7(3):e256. doi:10.1038/nutd.2017.3
 33. Cutler L, King B, McCarthy N, et al. Appetite for life: an evaluation of a primary care lifestyle programme. *J Prim Health Care.* 2010;2(4):281–7. doi:10.1071/HC10281
 34. Williams M, Cairns S, Simmons D, Rush EC. Face-to-face versus telephone delivery of the Green Prescription for Māori and New Zealand Europeans with type-2 diabetes mellitus: influence on participation and health outcomes. *N Z Med J.* 2017;130(1465):71–9.
 35. McAuley KA, Murphy E, Mclay RT, et al. Implementation of a successful lifestyle intervention programme for New Zealand Māori to reduce the risk of type 2 diabetes and cardiovascular disease. *Asia Pac J Clin Nutr.* 2003;12(4):423–6.
 36. Krebs JD, Elley CR, Parry-Strong A, et al. The Diabetes Excess Weight Loss (DEWL) Trial: a randomised controlled trial of high-protein versus high-carbohydrate diets over 2 years in type 2 diabetes. *Diabetologia.* 2012;55(4):905–14.
doi:10.1007/s00125-012-2461-0
 37. Forrest R, Taylor L-A, Roberts J, et al. Fighting fit, fighting fat! The Hinu Wero approach. *Alternative.* 2016;12(3):282–97. doi:10.20507/AlterNative.2016.12.3.6
 38. Eggleton K, Stewart L, Kask A. Ngatiwai Whakapakari Tinana: strengthening bodies through a Kaupapa Māori fitness and exercise programme. *J Prim Health Care.* 2018;10(1):25–30. doi:10.1071/HC17068
 39. Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group. Preferred reporting items for systematic reviews and meta-analyses: The PRISMA Statement. *J Clin Epidemiol.* 2009;62(10):1006–12. doi:10.1016/j.jclinepi.2009.06.005

40. Durie M. Māori cultural identity and its implications for mental health services. *Int J Ment Health*. 1997;26(3):23–5. doi:10.1080/00207411.1997.11449407
41. Ministry of Health. Diabetes. Wellington: Ministry of Health; 2021. [cited 2021 March 31]. Available from: <https://www.health.govt.nz/your-health/conditions-and-treatments/diseases-and-illnesses/diabetes>.
42. Naper J, Manetto L, Wiren D. A project to improve the quality of care for overweight and obese patients in a Nelson general practice. *J Prim Health Care*. 2017;9(4):321–7. doi:10.1071/HC17009
43. Puhl RM, Heuer CA. Obesity stigma: important considerations for public health. *Am J Public Health*. 2010;100(6):1019–28. doi:10.2105/AJPH.2009.159491
44. Glenister KM, Malatzky CA, Wright J. Barriers to effective conversations regarding overweight and obesity in regional Victoria. *Aust Fam Physician*. 2017;46(10):769.
45. Claridge R, Gray L, Stubbe M, et al. General practitioner opinion of weight management interventions in New Zealand. *J Prim Health Care*. 2014;6(3):212–20. doi:10.1071/HC14212
46. Gray L, Stubbe M, Macdonald L, et al. A taboo topic? How General Practitioners talk about overweight and obesity in New Zealand. *J Prim Health Care*. 2018;10(2):150–8. doi:10.1071/HC17075
47. Sonntag U, Brink A, Renneberg B, Braun V, Heintze C. GPs' attitudes, objectives and barriers in counselling for obesity – a qualitative study. *Eur J Gen Pract*. 2012;18(1):9–14. doi:10.3109/13814788.2011.627424
48. NAAFA (National Association to Advance Fat Acceptance). Las Vegas: National Association to Advance Fat Acceptance; 2020. [cited 2021 March 31]. Available from: <https://naafa.org/>.
49. Johnson F, Beeken RJ, Croker H, Wardle J. Do weight perceptions among obese adults in Great Britain match clinical definitions? Analysis of cross-sectional surveys from 2007 and 2012. *BMJ Open*. 2014;4(11):e005561. doi:10.1136/bmjopen-2014-005561
50. Ard JD, Lewis KH, Rothberg A, et al. Effectiveness of a Total Meal Replacement Program (OPTIFAST Program) on weight loss: results from the OPTIWIN Study. *Obesity*. 2019;27(1):22–9. doi:10.1002/oby.22303

51. Castellana M, Conte E, Cignarelli A, et al. Efficacy and safety of very low calorie ketogenic diet (VLCKD) in patients with overweight and obesity: a systematic review and meta-analysis. *Rev Endocr Metab Disord*. 2020;21(1):5–16. doi:10.1007/s11154-019-09514-y
52. Maston G, Gibson AA, Kahlaee HR, et al. Effectiveness and characterization of severely energy-restricted diets in people with class III obesity: systematic review and meta-analysis. *Behav Sci*. 2019;9(12):144. doi:10.3390/bs9120144
53. Jebb SA, Ahern AL, Olson AD, et al. Primary care referral to a commercial provider for weight loss treatment versus standard care: a randomised controlled trial. *Lancet*. 2011; 378(9801):1485–92. doi:10.1016/S0140-6736(11)61344-5
54. Howatson A, Wall C, Turner-Benny P. The contribution of dietitians to the primary health care workforce. *J Prim Health Care*. 2015;7(4):324–32. doi:10.1071/HC15324
55. Johns DJ, Hartmann-Boyce J, Jebb SA, et al. Diet or exercise interventions vs combined behavioral weight management programs: a systematic review and meta-analysis of direct comparisons. *J Acad Nutr Diet*. 2014;114(10):1557–68. doi:10.1016/j.jand.2014.07.005
56. Baur LA, Fitzgerald DA. Recommendations for bariatric surgery in adolescents in Australia and New Zealand. *J Paediatr Child Health*. 2010;46(12):704–7. doi:10.1111/j.1440-1754.2010.01875.x
57. Rajput N, Tuohy P, Mishra S, et al. Overweight and obesity in 4– 5-year-old children in New Zealand: results from the first 4 years (2009–2012) of the B4School Check programme. *J Paediatr Child Health*. 2015;51(3):334–43. doi:10.1111/jpc.12716
58. Mummery W, Kolt G, Schofield G, McLean G. Associations between physical activity and other lifestyle behaviors in older New Zealanders. *J Phys Act Health*. 2007;4(4):412–23. doi:10.1123/jpah.4.4.412
59. Duncan S, Goodyear-Smith F, McPhee J, et al. Family-centered brief intervention for reducing obesity and cardiovascular disease risk: a randomized controlled trial. *Obesity*. 2016;24(11):2311–8. doi:10.1002/oby.21602
60. Bell AC, Swinburn BA, Amosa H, Scragg RK. A nutrition and exercise intervention program for controlling weight in Samoan communities in New Zealand. *Int J Obes*. 2001;25(6):920–7. doi:10.1038/sj.ijo.0801619

61. Anderson YC, Wynter LE, Moller KR, et al. The effect of a multidisciplinary obesity intervention compared to usual practice in those ready to make lifestyle changes: design and rationale of Whanau Pakari. *BMC Obes.* 2015;2(1):41. doi:10.1186/s40608-015-0068-y
62. Oetzel J, Rarere M, Wihapi R, et al. A case study of using the He Pikinga Waiora Implementation Framework: challenges and successes in implementing a twelve-week lifestyle intervention to reduce weight in Māori men at risk of diabetes, cardiovascular disease and obesity. *Int J Equity Health.* 2020;19(1):103. doi:10.1186/s12939-020-01222-3

Chapter 4: Meta-ethnography Review

Study 1: Qualitative Literature Review

Overview

As highlighted in chapter 3, there are weight management interventions available through general practice in NZ. However, with obesity and its management an individualised experience, it is important to capture the views of those in this space: the clinicians and the clients. This chapter provides a novel approach to synthesising clinician and client qualitative literature not conducted in NZ before.

Title: Barriers to obesity health care from GP and client perspectives in New Zealand general practice: A meta-ethnography review

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Abstract

Obesity is a complex international health concern affecting individual quality of life and contributing to an unsustainable strain on national health systems. General practice is positioned as best suited to deliver weight management healthcare, yet, obesity rates remain high suggesting barriers are experienced within this space. The aim of this review is to synthesise general practitioner and client perspectives of weight management to identify barriers experienced in New Zealand general practice. Six databases were searched resulting in eight articles being included in this review. This interpretive synthesis was guided by principles of meta-ethnography and grounded theory. Four overarching themes were identified from client and general practitioner perspectives: stigma, communication, inadequate healthcare (system limitations for general practitioners and lack of tailored advice for clients) and sociocultural influences. These four barriers were found to be interdependent, influencing each other outside the general practice context, highlighting the intersectionality of weight management healthcare barriers and further complicating effective weight management within general practice. Clients reported wanting tailored, non-stigmatised, effective weight management healthcare, yet, general practitioners reported being ill-equipped to provide this due to barriers both within and outside the limits of their practice. General practice requires more systemic support to deliver effective weight management including public health campaigns and indigenous health information to reduce health inequities. An appraisal of general practice being 'best suited' to deliver effective weight management healthcare that is culturally appropriate is urgently required to improve obesity related health outcomes in New Zealand.

Abbreviations

NZ – New Zealand

MOH – Ministry of Health

GP – General Practitioners

BMI – Body Mass Index

Introduction

Obesity is a significant health issue with 650 million adults worldwide classed as obese (1) and New Zealand (NZ) ranked the third most obese nation in the Organisation for Economic Co-operation and Development (OECD) (2). Obesity is a risk factor for several other physiological and psychological health conditions (2, 3) which further impact an individual's health. Obesity and obesity comorbidity rates are linked to low quality of life (4) and many also draw links between escalating obesity rates and economic strain on national health systems, such as via healthcare demand and a loss of productivity (5-8). From a national health system perspective, obesity and obesity related comorbidity costs in NZ are estimated at \$624 million (5). This is recognised as an unsustainable economic strain (2), resulting in the national health system having a vested interest in providing effective weight management interventions for those living with obesity. Obesity in NZ is recognised as a significant equity issue with Indigenous Māori, as well as Pacific and rural populations experiencing higher obesity rates and poorer health outcomes (9).

Over 34% of NZ adults are classified as obese, with Indigenous Māori and Pacific populations experiencing 51% and 71% obesity rates respectively (9). Obesity is a significant health issue despite being considered a preventable and treatable health concern through weight management interventions within and outside of general practice (10). The Ministry of Health (MOH) positions general practice healthcare professionals, including general practitioners (GPs) as best suited to deliver weight management healthcare due to the frequency with which they see their patients (here after referred to as clients) (11, 12) and their capacity to assess, measure, intervene and monitor the weight of clients in their practice (10). There are some weight loss interventions available in NZ general practice (13), however, these are limited in their efficacy (13) and effective weight management requires a combination of dietary changes, exercise engagement, and behaviour changes actioned in culturally appropriate ways (13).

Previous literature has highlighted that effectively delivering weight management interventions has been challenging for GPs (14). Barriers reported in overseas literature include ineffective communication strategies, differences in perspectives of the role and responsibility of a GP in the obesity management process, the stigmatisation of obesity in society as well as within the health system and its associated workforce, the perceived lack of motivation of clients to lose weight, the normalisation of obesity, social determinants of health, and healthcare system limitations (15-18). Despite the availability of interventions in NZ general practice, obesity rates are continuing to rise across all ethnicities in NZ. With obesity regarded as a complex health concern, so too is obesity management, indicating that potentially, there are unknown barriers to effective weight management in the NZ general practice space. There is no clear understanding of the barriers faced by GPs in delivering weight management healthcare to the unique and culturally diverse NZ population. In addition, effective healthcare for indigenous populations around the world include the vital component of being culturally appropriate, yet there is limited understanding of obesity management in general practice from a Māori worldview (19), or from that of other vulnerable populations including Pacific and rural, despite experiencing significant health inequities and barriers to healthcare services (20, 21).

While some literature exists in countries that have lower obesity rates and lower strain on national health systems or economies, there is minimal understanding of weight management healthcare perspectives in NZ despite being the third most obese nation worldwide. While a limited cadre of qualitative literature exists on weight management healthcare in general practice from either the GP or client perspective in NZ, there are no NZ studies that bring these perspectives together. This novel

study aims to fill this knowledge gap and synthesise GP and client perspectives in an effort to identify barriers to weight management healthcare in NZ general practice.

Methods

This review was executed in three stages: identification of studies through database searching; content extraction and critical appraisal; and synthesis of extracted content. Six major electronic databases were searched for peer-reviewed papers: Scopus; PubMed; Web of Science; APA Psych Net; Google Scholar and AlterNative with no date restriction. Keywords used in the search strategy were variations of 'obesity', 'overweight', 'obese', 'weight', 'general practice', 'primary care', 'GP', 'clinician', 'doctor', 'barrier', 'perspective', 'attitude', 'view', 'belief', 'experience', 'client', 'patient', 'opinion' and 'New Zealand' with no date restrictions.

Inclusion criteria comprised: original research that focused on the healthcare barriers from healthcare professionals or client perspectives; based in primary care or general practice; published in English language; have a NZ adult sample aged 25 – 64; and have a qualitative component. While the role of nurses in weight management is important and recognised, the focus was on general practice which includes a multidisciplinary workforce of nurses, doctors, health coaches, health improvement practitioners and kaiawhena (Māori advocate) in some practices. Therefore, the search terms 'general practice' and 'primary care' were used as well as 'GP' and 'general practitioner'. While three papers were identified through this search that included a primary care nurse perspective, none of these papers met the other criteria for inclusion. Articles were included (and data extracted) if they had components that addressed barriers to weight management healthcare in general practice, even if the research was not solely focused on barriers.

This interpretive synthesis was guided by the principles of meta-ethnography (22) and grounded theory (23) to identify emerging themes. First, each article was read to understand the first order constructs (participants' direct quotes and study designs) and re-read multiple times to permit familiarity with the reported barriers. Second order constructs (authors' interpretations and identification of barriers) were grouped into themes for reciprocal translation. Analysis was loosely guided by grounded theory, to enable novel themes from the data to emerge and identify the key barriers faced by GP and clients in the general practice context.

Results

Figure 1 highlights the literature search process for this study with a total of 8 articles found that fit the criteria for this review. Four studies were found with a focus on the GP perspective of weight management healthcare in general practice (24-27). Four studies were found with a client perspective (28-31), although these were not solely focused on weight management in a general practice context. One of these four client articles was specific to the indigenous Māori culture of NZ (Kaupapa Māori design) whereby Māori worldview governs the research (31). Table 1 shows the details of the included studies in this review.

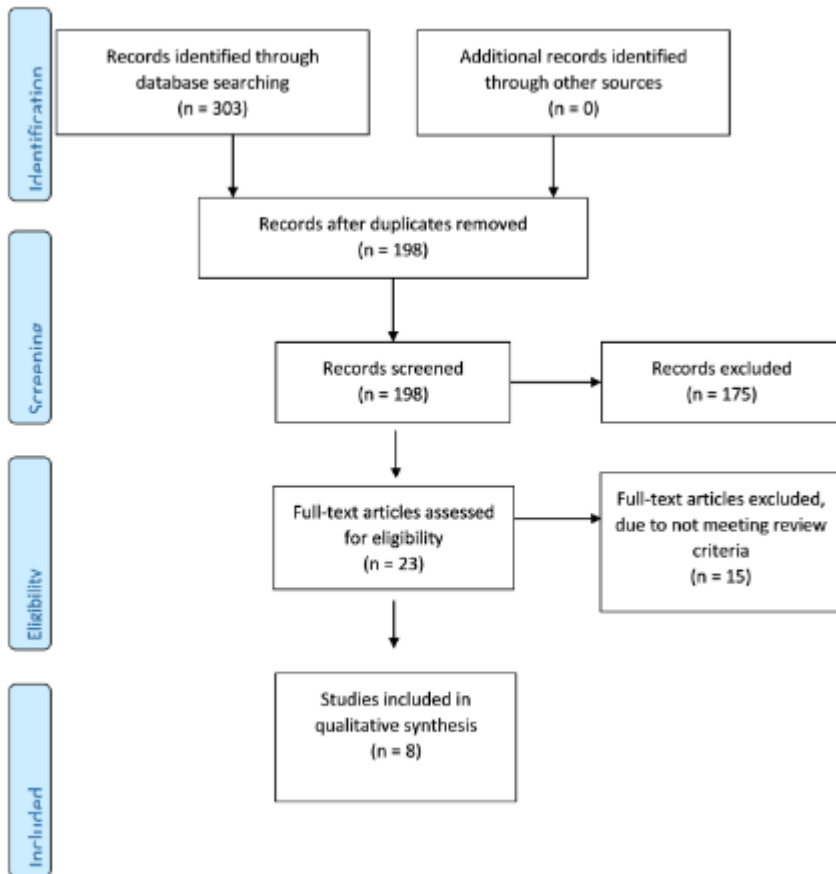


Figure 2: Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA) 2009 flowchart diagram.

Table 3: Studies included in this Review

Paper	Aim	Methodology	Sample	Findings	Barriers
Gray et. al (2018)	To identify communication strategies used by (GPs) to open the topic of weight and weight management in routine consultation	Secondary analysis of video recorded consultations. Content and interactional analysis conducted in context of entire consultation	n= 36 Gender: 20 male, 16 female Age: 20-89 Ethnicity: NZ European, Māori Pasifika and Asian	Weight discussion was initiated by GPs more than clients. GPs employed opportunistic strategies twice as often as they used structured strategies	Communication Stigma
Swinburn et. al (1997)	To assess the attitudes and perceptions of GPs towards the practice of writing green prescriptions (exercise intervention)	Qualitative design and analysis through structured focus groups	n=25 Gender, age, ethnicity not specified	GPs felt comfortable discussing and prescribing exercise with and to patients. Time constraints, resource and training required for successful implementation.	Time Resources
Claridge et. al, (2014)	To identify GP opinion on weight management interventions	Qualitative study using inductive thematic analysis of semi-structured interviews	n= 12 Gender: 7 male, 5 female Age: 31-60 Ethnicity: Not collected	Five key themes found; What the GP can do; The roots of the obesity problem; Why the GP doesn't succeed; Primary care interventions; and Bariatric surgery	Normalisation of obesity in society Client issues Lack of efficacious interventions Low resource availability Stigma
Patel et. al, (2011)	To identify why GPs counsel for Green Prescription and examine GPs views and experiences of Green Prescription	Qualitative design using an inductive thematic response from face-to-face interviews	n=15 Gender: 10 female, 5 male Age: 36-64 Ethnicity: Not specified	GPs prescribed Green Prescription for primary preventive (e.g., weight control) and secondary management (e.g., diabetes management) purposes. Time constraints within the consultation was identified as a barrier. Green Prescription was	Time

	counselling for the management of depression			viewed as beneficial for depression management	
Russell & Carryer (2013)	To explore 'Large Bodied' Women's experiences of accessing New Zealand-based general practice services	Descriptive, qualitative inquiry with post-structural feminist lens. Semi-structured interviews were analysed thematically.	n= 8 Gender: All Female Age and Ethnicity not specified	Negative stigmatising experiences were reported, concerns about feeling 'safe' to access care, participants were reported to be aware of their 'inferior' positioning in society that values thinness.	Stigma Sociocultural influences Communication
Doolan-Noble et. al, (2019)	To link the weight management experiences of these men in primary care, with their experiences of life in general as big men.	Qualitative design using semi-structured interviews and coded against priori codes.	n=14 Gender: All male Age: Not specified Ethnicity: 12 NZ/European, 1 Samoan, 1 Tongan	Social consequences of obesity, stigma, tailored communication was found to be relevant to primary care experiences. Gender- specific healthcare lacking.	Sociocultural influences Stigma Communication
Dean (2007)	To explore the attitudes and subjective experiences of those who received Green Prescription	Nested qualitative study within mixed methods approach using semi-structured interviews and an inductive approach to identify themes	n=15 Gender: 6 male, 9 female Age: 43-78 Ethnicity: 11 NZ European, 4 Māori	Four themes emerged: tailoring of advice given; barriers to physical activity and psychological limitations; internal motivators including spiritual benefits; and role of significant others	Tailored Advice Internal motivations Time Sociocultural Influences Environment
Forrest et. al, (2016)	To evaluate the effectiveness of a 9 week group exercise	Kaupapa Māori mixed methods. Qualitative part	n= 13 participants and 1 Trainer interview	Māori practices (whakawhanaungatanga) is of the utmost importance for success of health initiatives	Psychological and physical motivations Time

	initiative that promotes physical activity and focuses on fat loss in order to reduce obesity in Māori.	used for this review. Online focus group and interview with trainer analysed	Gender/ Age not detailed for qualitative section of study		Sociocultural influences
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This review found four overarching barriers to weight management healthcare existed from both client and GP perspectives. Table 2 shows the first and second order constructs that formed the themes used for reciprocal translation detailed below. The four barrier themes were stigma, communication, inadequate healthcare (system limitations for GPs and lack of tailored advice for clients) and sociocultural influences. Whilst these barriers influenced the general practice context in isolation, they were also found to overlap with each other, highlighting the interconnected nature of these categorical barriers, creating an interdependent system of barriers to effective obesity management. The intersectionality of these four barriers on weight management healthcare is reported below.

Table 4: First Order Constructs, Reciprocal Translation of Second Order Constructs and Themes

First Order Constructs	Second Order Constructs	Theme
Client		
<p><i>[Assumption]it's that lazy thing, that you're greedy, gutsy, stupid. (Angela) (28)</i></p> <p><i>You're always sweating away when. . .everyone else is sort of sitting around relatively comfortable. . .and you think, oh god this is not good, . . .so there's that sort of social embarrassment. (Participant 4) (29)</i></p>	Weight bias experiences (e.g. negative insults and humour, negative body language, dismissal, unmet needs) (28)	Stigma
<p><i>I choose not to go for certain things. I will avoid anything that will expose my imperfect body or go to the utmost extreme lengths...smears and all that exposing type thing unless I really have to. Probably it's due to the fact of how many bad times I've had with people that I just don't feel comfortable...you're constantly looking for responses. (Loreen) (28)</i></p>	Avoidance of future healthcare appointments due to previous humiliating experiences and negatively 'labelled' in and out of general practice (28, 29)	Stigma
<p><i>We know what needs to be done we just don't know how it's going to be done. (Participant 7) (29)</i></p> <p><i>If you aren't going to listen to me, then why should I listen to you? (Angela) (28)</i></p> <p><i>They don't give you a lot to resolve the issue if you desire. I have asked several times for assistance with my weight issue and haven't really been given the solution or tools that I need to help with that. I think they are too scared to approach it and don't know how to approach it without being negative or scaremongering. (Selina) (28)</i></p>	Lack of effective or clear communication within the GP- client relationship or not feeling 'heard' by their health professional (28, 29)	Communication
<p><i>It got to the point that everything about you was your weight. Whether you were sick, whether you went in for something like an infection on your leg – everything was about the weight. (Angela) (28)</i></p>	Selectively disclosing health concerns to avoid their concerns being 'dismissed' by GP as being 'weight focused' (28)	Communication

<p><i>They don't come up with any b****y great ideas with what I can do about it, they, you know they have a bit of a moan and away you go. Mmm. (Participant 9) (29)</i></p>	<p>Unsatisfactory and unhelpful advice received from GPs (29)</p>	<p>Inadequate Healthcare</p>
<p><i>Just don't see the medical part of the person, of course that's what you are there for, but you've got to see the whole person first before you see what you're trying to 'fix', because a lot of its combined I reckon, well it's all combined really. (Monica) (28)</i></p>	<p>Lack of tailored gender specific advice, 'holistic', cultural/ spiritual or social support advice relevant to the individual (29-31)</p>	<p>Inadequate Healthcare</p>
<p><i>Being involved with you and the Green Prescription made me somewhere along the line pull myself together, mind body and soul, so I healed fast. (Christine, 51 years, rural Māori) (30)</i></p> <p><i>[Barriers were] Put it off tomorrow, all the usual ones. It's too cold, it's too wet. (Kevin, 71 years, rural European) (30)</i></p> <p><i>No barriers except my own mental state... can't be bothered today, I'm not going to. (Margaret) (30)</i></p>	<p>Barriers to physical activity such as weather, physical environment, time, health and psychological limitations (30)</p>	<p>Sociocultural Influences</p>
<p><i>I think that personal responsibility ultimately, . . . you are responsible for your body, that is the bottom line. However, the way that you think about what you put in your mouth is . . . influenced by all sorts of messages that you get from the environment around you. (Participant 13) (29)</i></p> <p><i>Physically I was up to it; mentally I wasn't. I fell off about four weeks into the Hinu Wero mainly because I think grabbing stuff to eat was too easy and I suffered mentally as it got easier to eat all kinds of food. It was hard to get back into routine. (P1, male, 44) (31)</i></p>	<p>Difficult to make healthy food choices in an obesogenic environment that makes (unhealthy) food 'quicker and easier' to access (31)</p>	<p>Sociocultural Influences</p>
<p>GPs</p>		
<p><i>If we can control the, the sugar levels and your weight we, er, could actually control that blood pressure too. (DS-GP20-01) (25)</i></p> <p><i>Our practice is predominantly Māori and there's this issue of whakamā, or shame around being seen to be unhealthy and overweight. (GP 8) (24)</i></p>	<p>Avoiding stigma during consultation to avoid negative reactions from patient or damage GP-client relationship (25)</p>	<p>Stigma</p>
<p><i>Being obese has a whole lot of medical implications. It's got tons of social implications</i></p>	<p>Utilising the clinical relevance of obesity to not</p>	<p>Stigma</p>

<p><i>but it's the medical ones that we tend to. We are on safe ground I suppose with medical implications. (GP 2) (24)</i></p>	<p>offend their client and avoid stigmatisation (25)</p>	
<p><i>[Opportunistic discussion] It's been a few years since we checked for glucose f- for diabetes and you know with you being overweight we ought to maybe review that again. (TS-GP03-12) (25)</i></p>	<p>Structured conversation tactics more difficult to use than opportunistic conversation tactics during GP-client discussions (25)</p>	<p>Communication</p>
<p><i>Using indirect language: Now, s- some people manage to control the diabetes just by doing very good exercise and by eating a very healthy diet. (DS-GP24-03. GP) (25)</i></p> <p><i>Open ended and neutral question used by GP: Weight wise where do you think you're at? (25)</i></p>	<p>Challenging to have weight management conversations which are constructively progressed, no single 'best way' for discussion (25)</p>	<p>Communication</p>
<p><i>Medication Intervention: I do use it a bit, but very uncommonly now. I find them all pretty useless... we've all been through them all over the years. (GP 6) (24)</i></p> <p><i>I say to patients 'exercise has got many, many health benefits'. I think compared to the appropriate dietary changes, it's pretty lousy as a weight loss intervention. (GP 11) (24)</i></p>	<p>GPs general lack of faith in the efficacy of primary care interventions, no unanimous intervention identified as 'successful' (24)</p>	<p>Inadequate Healthcare</p>
<p><i>[Lack of] Time! Because patients generally have quite complex problems and multiple problems. (GP 7) (27)</i></p> <p><i>It's either publicly you don't fit the very restrictive criteria, or privately you don't have the money to go [for bariatric surgery]. (GP 3) (24)</i></p>	<p>Time constraints, system barriers (lack of resources for GPs) (24, 26, 27)</p>	<p>Inadequate Healthcare</p>
<p><i>They [clients] had visitors from their family who told them to change their doctor because 'since you've been seeing that doctor you don't look well' and that their perception was that losing weight was equated with sickness. (GP 3) (24)</i></p>	<p>Overweight is seen as 'normal' in society (therefore not needing 'treatment') (24)</p>	<p>Sociocultural Influences</p>
<p><i>Poorer areas don't have the same number of sports and recreation facilities as more affluent areas. And yet we know the obesity epidemic is worse in poorer areas. (GP 8) (24)</i></p> <p><i>Physically they're doing well. It's these other areas like the mental and the social and I think that as a trainer if we can train ourselves within these areas then we can work with the whānau in areas that they are lacking (31)</i></p>	<p>Obesity driven by both societal and individual factors (outside GP context) such as obesogenic environment and rooted in client's personal issues (24)</p>	<p>Sociocultural Influences</p>

Stigma

Clients reported experiencing obesity stigma both within and outside of the general practice context. In some cases, stigma reported outside the general practice context (29) seeped in to healthcare interactions. The latter was perceived as a barrier to accessing further healthcare in general as well as weight management (28). Being obese was associated with feelings of social embarrassment, shame, or being perceived as having additional character flaws such as being lazy or stupid (28). Other stigma examples included use of inappropriate humour from physicians, verbal insults, negative body language, breaches of dignity and unmet healthcare needs (due to their obesity status and active avoidance at stigma inducing situations) (28, 29).

GPs reported an awareness of obesity stigma and positioned the latter as a barrier to providing effective weight management in their practice (31). GPs actively attempted to avoid stigma in their consultations in an effort to not offend their client or create an imbalance in the doctor–client relationship (25). Whilst stigma avoidance was reported to be important, achieving this was difficult and specific conversational tactics were used. These included the use of clinical relevance as safe or neutral conversational territory (24) to justify bringing up a client’s weight during consultation (25) and framing obesity as a non-discriminatory health concern affecting blood pressure or risk of diabetes from sugar levels in the blood (25). These stigma avoidance techniques reportedly helped create constructive conversations that potentially led to health improvement while avoiding negative reactions from the client (25).

Communication

Clients reported a range of communication barriers between them and their health care provider. These included: difficulties in raising the topic of weight with their GP, inappropriate (29) terminology used by their GP, unsatisfactory advice given about how to manage their weight (29) or not being advised about useful strategies or tools to manage their weight (28), inappropriate style of communication from their GP, not feeling ‘heard’ by their GP or having their health concerns dismissed as related to their excess weight (28). Some clients reported negative experiences and stigma with communication in general practice (29) as well as the need for sensitivity and culturally appropriate weight management advice, especially for Māori clients (31). These communication barriers led to some clients purposefully disclosing only selected health concerns (28) to their GP to avoid communication focused solely around their weight.

GPs also reported communication as a barrier to providing effective weight management healthcare in their practice. Raising the delicate topic of weight management (25), discussing intervention options with the client, framing the clinical relevance of why weight is being raised, and avoiding stigmatisation when asking questions were all factors that were found to be challenging (24, 25). Opportunistic conversation tactics were used twice as often as structured tactics and useful discourse was positioned as questions that were neutral, indirect, or open-ended (25). Highlighting the clinical relevance of weight management was suggested as being an effective technique during discussions (25) and helped with GPs avoidance of offending their client (24, 25).

Inadequate Healthcare (Client: Lack of Tailored Advice / GP: System Limitations)

Clients reported a lack of appropriate tailored advice as a barrier to effective weight management. Some clients expressed that they wanted clear straight forward weight management help from their GPs (29). Yet, the advice they received was inadequate, unsatisfactory, unhelpful (29), not culturally appropriate (31), nor directly relevant to their individual needs (30), which negatively impacted their experiences with weight management interventions. A failure to consider health ‘holistically’ (with

the inclusion of cultural and spiritual components) (31), to attend to gender specific weight management issues (29) and tailor advice to the challenges facing individual clients was reported to impact the likelihood of clients adhering to exercise in any lifestyle intervention (30, 31).

GPs reported that system limitations acted as a barrier for providing effective weight management healthcare as the systems in place were inadequate for their clients' needs. GPs expressed a desire to want to provide help with weight management to their clients, but they lacked faith in the available general practice weight interventions with some options described as 'useless' or 'pretty lousy' (24). Barriers included low resource availability, lack of efficacious interventions, wide variations of interventions, lack of comprehensive training, and ranging opinions of the national weight management guidelines and bariatric surgery options (24, 26). Time constraints were reported to be a significant barrier to referring their clients to the Green Prescription (exercise intervention) (26, 27) whereby GPs expressed that they see clients with a range of complex problems leaving minimal time for weight management to be addressed (27).

Sociocultural Influences

Those living with obesity reported that sociocultural factors acted as barriers to adhering to chosen weight management programmes. Adhering to healthy lifestyle options was found to be psychologically challenging, and influenced by a range of environmental factors, cues, or triggers (29). Specific barriers to physical activity engagement were reported to include individual factors (such as time, physical health or psychological limitations) and external factors (weather, facilities) (30). Additionally, a lack of time management and routine also acted as a barrier to healthy decision making, whereby the ability to access unhealthy food quickly was 'too' convenient (31). Cultural values were crucial for effective weight management, specifically for the Māori population (31) as well as one Pacifica client reportedly wanting to avoid social contexts to avoid their family commenting about their excess weight (29). Overall, the reasons for adherence and non-adherence were found to be individualised, complex, and outside of the general practice context that offered the weight management health 'intervention'.

GPs also reported that sociocultural factors outside the general practice context acted as barriers to providing effective weight management healthcare. These barriers included the links between obesity and poverty, perception of clients cultural 'norms' whereby weight loss was associated with illness (24), or social pressures whereby some of their clients lived in sociocultural contexts that perceived obesity to be associated with concepts of 'shame' (24). GPs reported an overall sense of disempowerment with regards to their ability to carry out their role effectively when it came to obesity management in sociocultural contexts where 'obesity' was viewed as 'normal' (24).

Intersectionality of Barriers

These four barriers were found to act interdependently highlighting the intersectionality of these categorical barriers. This includes the interconnectedness of stigma and communication, stigma and sociocultural influences, communication and inadequate healthcare, as well as sociocultural influences and inadequate healthcare. This intersection of barriers makes effective weight management more difficult for GPs to deliver. This synthesis explains the how these barriers were found to interact and impact negatively on weight management healthcare in NZ general practice.

Communication was found to influence, and be influenced by, stigma and inadequate healthcare barriers. Whilst obesity stigma is experienced in a variety of ways throughout many facets of an individual's life (32), the subjective or constructed nature of the 'obesity' definition (33) and the embodiment of an 'obese identity' (34) can also vary in different sociocultural contexts, which,

further complicates the GPs role when consulting a variety of clients daily. Stigma avoidance behaviour consequently causes communication breakdowns, whereby, GPs are receiving limited health information from their clients, which, increases the likelihood of unmet healthcare needs for clients. There is a need to remove stigma stemming from 'obesity' in the general practice context which can then ensure open, honest communication between the client and their GP, which will contribute to making sure all healthcare needs are met.

Sociocultural factors outside the general practice were found to influence, and be influenced by, stigma and inadequate healthcare barriers. GPs and clients reported that the efficacy of the weight management interventions available in general practice (10) was influenced by other factors such as the obesogenic environment (35) and sociocultural norms, including Māori cultural worldview for participants who identified as Māori (31, 36, 37). Sociocultural norms and stigma dictate how 'obesity' is constructed and 'managed' (33, 36) within different populations. This intersection of barriers to obesity management is unique to each individual which further limits the efficacy of the minimal and non-tailored interventions available for GPs to refer their clients to. This intersectionality of obesity (38), when combined with the western sociocultural norm of 'political correctness' (39) makes, at this point in history, 'best practice' for GPs complex with their need to provide weight management healthcare whilst simultaneously avoiding stigma or damaging their therapeutic relationships. Whilst GPs are well versed in the biomedical knowledge of obesity, and clients are well aware of the social determinants of health impacting their weight management, improving health literacy for both GPs and clients would be beneficial for general practice. There is a need for clients to be informed that GPs addressing weight in consultations is a regular part of a health check-up and GPs need to be systemically supported in avoiding stigma and cultural offence when addressing health care needs in general practice contexts.

Discussion

This study synthesised the barriers to weight management healthcare in general practice from GP and client perspectives in NZ. Four overarching barriers were identified: stigma, communication, inadequate healthcare (system limitations/ lack of tailored advice), and sociocultural influences. It was surprising to find that both GPs and clients experienced similar barriers, indicating that there is some shared ground between these different groups. These barriers align with previous international literature which also identifies multi-levelled barriers to weight management in general practice, including stigma, communication, clinical and non-clinical factors, and sociocultural norms (16, 37, 40-43). This review also shed light on the intersectionality of obesity management barriers, with four barriers also acting interdependently outside general practice further adding to the complicated web of barriers GPs are faced with. This intersectionality factor was a novel finding for this NZ review, although it is not surprising given the World Health Organization and MoH consensus that obesity and weight management care is complex and multifactorial (1, 2). Overall, this review found that clients sought tailored, non-stigmatised, effective weight management healthcare, but, GPs reported being ill-equipped to provide this due to barriers both within and outside the limits of their practice.

This review found that the perspective on 'obesity' differed between GPs and clients. Whilst attempting to find a unanimous definition of 'obesity' that covers objective and subjective perspectives seems near impossible, there is potential to find some common ground within the general practice context. Similar to the previous smoking cessation health campaigns seen in NZ (44), setting the expectation that weight management will be addressed in every consultation could assist desensitizing the weight discussion, creating an emotionally and culturally safe environment

for the client, and minimise the risk of clients not disclosing a complete picture of their health to their GP, therefore avoiding further health issues.

Due to the multi-levelled nature of obesity, this campaign would benefit from including systemic support for GPs that incorporates education on appropriate conversational styles to use during weight management discussions. This would also assist with reclaiming the obesity discourse within the general practice context as a clinical health concern free from stigma or offence, which is also relevant for other countries experiencing the same barriers. Systemic support would also need to include culturally appropriate understandings so that both indigenous and non-indigenous populations will benefit. In addition, GPs could be supported to expand the weight discussions beyond the clinical definitions demarcated by the Body Mass Index (BMI) to find common ground with their clients who do not subscribe to this arguably flawed BMI tool (45, 46). This could include discussions around intersectionality of obesity and potential social determinants of health the client might be experiencing that are impacting effective weight management strategies. With over 10 million adult GP consultations every year in NZ alone (47), restructuring and normalising weight discussions within this context could lead to less stigma experiences, more effective communication, increased health outcomes for clients and increase the effectiveness of weight management healthcare in general practices worldwide (47).

This review found significant system and interactional barriers to weight management care. Time constraints, lack of effective interventions and resources, communication breakdowns and obesity stigma made the role of the GP difficult, which aligned with previous literature (14-16) and indicates the NZ population experience similar barriers to those faced overseas. The pervasiveness of the barriers found in this study was unexpected and suggests that the orientation of general practice as best positioned for weight management care be appraised. With similar barriers experienced from both GP and client perspectives, there is an ability to mitigate these in the future as there is already a level of shared difficulties.

This study highlights that further resources are needed to support GPs both within and outside their practice to provide effective weight management healthcare, otherwise any attempts to help their clients would be futile. Public health campaigns, culturally appropriate understandings of weight management, along with increased quality of intervention and referral options available within general practice would assist with mitigating some of these barriers. Culturally specific barriers within and outside general practice would also need to be addressed for any future health improvements to be effective. There was no Pacific Island, and only one indigenous Māori study that was eligible for inclusion in this review, despite being reported as high-risk populations for obesity. This lack of literature further highlights the health inequities that need to be urgently addressed so general practice can provide appropriate and effective obesity related healthcare to those in most need.

Like any review, this study is subject to publication bias and time lag. Further limitations are the inclusion of English only, exclusion of grey literature and secondary care. Surprisingly, there were only 8 articles found to fit the criterion for this review (with one indigenous focused Kaupapa Māori article and no Pacific literature) despite NZ's significant obesity health issue (2). The heterogeneous nature of the studies in this made synthesis difficult. Although qualitative research cannot be generalised, the authors of these articles draw on empirical methodologies, and whilst the study size was small and samples varied, it enabled an examination of each study's contexts, which is a strength of meta-ethnography (48).

This review sought to identify and synthesise GP and client perspectives of barriers to obesity management in general practice. This review found four key barriers (stigma, communication, inadequate healthcare, and sociocultural influences) that interdependently impacted the efficacy of weight management in general practice. Clients reported wanting effective weight management advice, but GPs reported an inability to provide effective options. Mitigating these barriers is possible as both groups experienced similar barriers within the general practice context. More resources, support and training is needed for both GP and clients with regards to weight management. Clients could be better informed about the health related issue obesity is in the general practice context, and GPs could benefit from understanding the more sociocultural 'lived' experience of obesity, as well as reducing stigma through public health campaigns. An appraisal of general practice being 'best suited' to deliver weight management healthcare is suggested, as this study found this concept questionable.

New Zealand is currently embarked on major health reforms which include an emphasis on reducing inequity for our high needs populations and a greater focus on health promotion and prevention. This review demonstrates the opportunities for general practice to develop further innovative programs including the involvement of the whole primary care team and with a focus on culturally appropriate programs for Māori and Pacific clients as well as tailored programs to suit the needs of rural clients.

Declarations

Conflict of Interest Statement

The authors declare no conflict of interest. Funding was from Waikato District Health Board for Kimberley Norman to complete this research as part of gaining a PhD.

Availability of data materials

The data that supports this review are the already published manuscripts that are included for this review. These are identified in Table 1 and full references are available in the reference list.

References

1. World Health Organization. Obesity. <https://www.who.int/topics/obesity/en/>. Published 2022. Accessed 24 February, 2022.
2. Ministry of Health. Obesity. <https://www.health.govt.nz/our-work/diseases-and-conditions/obesity>. Published 2022. Accessed 28 February, 2022.
3. Goettler A, Grosse A, Sonntag D. Productivity loss due to overweight and obesity: a systematic review of indirect costs. *BMJ open*. 2017; 7(10): e014632-e014632.
4. Kolotkin R, Meter K, Williams G. Quality of life and obesity. *Obes Rev*. 2001; 2(4): 219-229.
5. Lal A, Moodie M, Ashton T, Siahpush M, Swinburn B. Health care and lost productivity costs of overweight and obesity in New Zealand. *Aust N Z J Public Health*. 2012; 36(6): 550-556.
6. Clough P, Destremau K. The wider economic and social costs of obesity: A discussion of the non-health impacts of obesity in New Zealand. *Wellington: New Zealand Institute of Economic Research*. 2015.
7. Wang YC, McPherson K, Marsh T, Gortmaker SL, Brown M. Health and economic burden of the projected obesity trends in the USA and the UK. *Lancet*. 2011; 378(9793): 815-825.
8. Withrow D, Alter DA. The economic burden of obesity worldwide: a systematic review of the direct costs of obesity. *Obes Rev*. 2011; 12(2): 131-141.
9. Ministry of Health. Obesity Statistics. <https://www.health.govt.nz/nz-health-statistics/health-statistics-and-data-sets/obesity-statistics>. Published 2021. Accessed 24 February, 2022.
10. Ministry of Health. Clinical Guidelines for Weight Management in New Zealand Adults. <https://www.health.govt.nz/publication/clinical-guidelines-weight-management-new-zealand-adults>. Published 2017. Accessed 25 February, 2022.
11. Ministry of Health. New Zealand Health Survey. Indicator: Visited or talked to a GP in past 12 months. N.d. Available: https://minhealthnz.shinyapps.io/nz-health-survey-2020-21-annual-data-explorer/_w_6a817f5d/#!/explore-indicators. Accessed 23 June, 2022.
12. Ministry of Health. Annual Report for the year ended 30 June 2013 including the Director-General of Health's Annual Report on the State of Public Health. Ministry of Health. <https://www.health.govt.nz/publication/annual-report-year-ended-30-june-2013>. Published 2013. Accessed 20 February, 2022.
13. Norman K, Chepulis L, Burrows L, Lawrenson R. Adult obesity management in New Zealand general practice: a review. *J Prim Health Care*. 2021.
14. Mazza D, McCarthy E, Carey M, Turner L, Harris M. "90% of the time, it's not just weight": General practitioner and practice staff perspectives regarding the barriers and enablers to obesity guideline implementation. *Obes Res Clin Pract*. 2019; 13(4): 398-403.
15. Sonntag U, Brink A, Renneberg B, Braun V, Heintze C. GPs' attitudes, objectives and barriers in counselling for obesity—a qualitative study. *Eur J Gen Pract*. 2012; 18(1): 9-14.
16. Glenister KM, Malatzky CA, Wright J. Barriers to effective conversations regarding overweight and obesity in regional Victoria. *Aust Fam Physician*. 2017; 46(10): 769.

17. World Health Organization. Social Determinants of Health: World Health Organization. https://www.who.int/health-topics/social-determinants-of-health#tab=tab_2. Published 2022. Accessed 25 February 2022.
18. Marmot M. The health gap: Doctors and the social determinants of health. *Scandinavian J Public Health*. 2017;45(7):686-93.
19. Boulton A, Gifford H, Kauika A, Parata K. Māori Health Promotion: Challenges for best practice. *AlterNative: An International Journal of Indigenous Peoples*. 2011;7(1):26-39.
20. Davis-Wheaton J. Breaking down health barriers in rural areas. *Kai Tiaki: Nursing New Zealand*. 2013;19(2):2.
21. Davy C, Harfield S, McArthur A, Munn Z, Brown A. Access to primary health care services for Indigenous peoples: A framework synthesis. *Int J Equity Health*. 2016;15(1):163.
22. Noblit GW, Hare RD. *Meta-ethnography: Synthesizing qualitative studies*. Vol 11: Sage; 1988.
23. Strauss A, Corbin JM. *Grounded theory in practice*. Sage; 1997.
24. Claridge R, Gray L, Stubbe M, Macdonald L, Tester R, Dowell AC. General practitioner opinion of weight management interventions in New Zealand. *J Prim Health Care*. 2014; 6(3): 212-220.
25. Gray L, Stubbe M, Macdonald L, Tester R, Hilder J, Dowell AC. A taboo topic? How General Practitioners talk about overweight and obesity in New Zealand. *J Prim Health Care*. 2018; 10(2): 150-158.
26. Swinburn BA, Walter LG, Arroll B, Tilyard MW, Russell DG. Green prescriptions: attitudes and perceptions of general practitioners towards prescribing exercise. *Br J Gen Pract*. 1997; 47(422): 567-569.
27. Patel A, Schofield GM, Kolt GS, Keogh JW. General practitioners' views and experiences of counselling for physical activity through the New Zealand Green Prescription program. *BMC Fam Pract*. 2011; 12: 119.
28. Russell N, Carryer J. Living large: the experiences of large-bodied women when accessing general practice services. *J Prim Health Care*. 2013; 5(3): 199-205.
29. Doolan-Noble F, Pullon S, Dowell T, Fuller D, Love T. Men living with obesity in New Zealand: What does this mean for health care in general practice? *Obes Res Clin Pract*. 2019; 13(3): 233-239.
30. Dean S, Elley C, Kerse N. Physical activity promotion in general practice: Patient attitudes. *Aust Fam Physician*. 2007; 36(12): 1061.
31. Forrest R, Taylor L-A, Roberts J, Pearson M, Foxall D, Scott-Chapman S. Patu™: Fighting fit, fighting fat! The Hinu Wero approach. *AlterNative: An International Journal of Indigenous Peoples*. 2016; 12(3): 282-297.
32. Lewis S, Thomas SL, Blood RW, Castle DJ, Hyde J, Komesaroff PA. How do obese individuals perceive and respond to the different types of obesity stigma that they encounter in their daily lives? A qualitative study. *Soc Sci Med*. 2011; 73(9): 1349-1356.
33. Burr V. *Social constructionism*. Routledge; 2015.34. Goffman E. Stigma: Notes on the management of spoiled identity. Simon and Schuster; 2009.

35. Swinburn B, Egger G, Raza F. Dissecting obesogenic environments: the development and application of a framework for identifying and prioritizing environmental interventions for obesity. *Prev Med.* 1999; 29(6): 563-570.
36. Howard NJ, Hugo GJ, Taylor AW, Wilson DH. Our perception of weight: Socioeconomic and sociocultural explanations. *Obes Res Clin Pract.* 2008; 2(2): 125-131.
37. Ball K, Crawford D, Jeffery R, Brug J. The role of socio-cultural factors in the obesity epidemic. *Obesity Epidemiology: from Aetiology to Public Health.* 2010; 2: 105-118.
38. Himmelstein MS, Puhl RM, Quinn DM. Intersectionality: An Understudied Framework for Addressing Weight Stigma. *Am J Prev Med.* 2017; 53(4): 421-431.
39. Fairclough N. Political correctness': The politics of culture and language. *Discourse Soc.* 2003; 14(1): 17-28.
40. Aboueid S, Pouliot C, Bourgeault I, Giroux I. Dietetic Referral Practices for Obesity Management in Primary Healthcare: A Systematic Review. *J Interprofessional Pract Educ.* 2018; 8(1).
41. Blackburn M, Stathi A, Keogh E, Eccleston C. Raising the topic of weight in general practice: perspectives of GPs and primary care nurses. *BMJ open.* 2015; 5(8): e008546.
42. Brewis AA. *Obesity: Cultural and biocultural perspectives.* Rutgers University Press; 2010.
43. Puhl RM, Heuer CA. Obesity stigma: important considerations for public health. *Am J Public Health.* 2010; 100(6): 1019-1028.
44. McRobbie H, Bullen C, Glover M, Whittaker R, Wallace-Bell M, Fraser T. New Zealand smoking cessation guidelines. *N Z Med J.* 2008;121(1276).
45. Bhurosy T, Jeewon R. Pitfalls of using body mass index (BMI) in assessment of obesity risk. *Curr Res Nutr Food Sci.* 2013;1(1):71-6.
46. National Association to Advance Fat Acceptance. NAAFA. <https://naafa.org/>. Published 2020. Accessed 25 February 2022.
47. Ministry of Health. New Zealand Health Survey Online: Ministry of Health. https://minhealthnz.shinyapps.io/nz-health-survey-2020-21-annual-data-explorer/_w_73e83a76/#!/explore-indicators. Published 2021. Accessed 2 February 2022.
48. Dissemination C. *Systematic reviews: CRD's guidance for undertaking reviews in healthcare.* York: University of York NHS Centre for Reviews & Dissemination. 2009.

Chapter 5: General Practitioner Short Report

Study 2: Survey

Overview

This chapter reports the results of a GP quantitative survey that was part of this mixed methods sequential explanatory research design. This survey extends on the findings from the first two review manuscripts (chapter 3 and 4) and is used to explore the views of GP's about weight management in general practice. The findings from this short survey prelude and guide the qualitative interviews in the following chapters.

Title: Waikato GP perspectives on obesity management in general practice: A short report.

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Abstract

Introduction: Obesity is a multifaceted clinical and public health issue affecting over 34% of New Zealand adults. The Ministry of Health has positioned general practice as the best-suited location for addressing the health effects of obesity. Previous literature has identified barriers to the delivery of effective obesity management in general practice. **Aim:** To explore Waikato GP perspectives to determine areas for improving the care of adults with weight problems. **Methods:** A short exploratory questionnaire was used to collect data from 29 GPs across the Waikato region. Descriptive statistics and content analysis were used. **Results:** The majority of GPs reported: they would wait for their patient to raise the issue of their weight; would offer weight advice themselves as a first option before considering referral; did not view general practice as best suited in tackling the obesity epidemic; and utilised bariatric surgery as a referral option while noting the inequities in access. **Discussion:** The survey identified barriers to discussing weight with patients and in finding effective treatment options. Psychosocial and sociocultural aspects were recognised as contributing factors to obesity, but not highlighted as available treatment options. Bariatric surgery was reported as a viable option for treatment but with barriers to access in the public system. This study found strong trends and themes which identify an urgent need for further exploration into weight management pathways in New Zealand.

Keywords: General Practice, Obesity, Weight Management, Inequity, Healthcare, Perspective, Opinion, Primary Care

What is already known: The rising obesity, and obesity comorbidity rates are causing significant strain on the New Zealand health system. GPs experience barriers to discussing, referring and treating the stigmatised and complex health issue of obesity in their limited time with patients.

What this research adds: GPs generally only raise the issue of weight management with selected patients and seem to have limited pathways for referral available to them. Two thirds of GPs do not regard general practice as the best location for addressing the obesity epidemic. Weight management is regarded as a shared responsibility requiring input from the Government and wider society as well as focussing on individual needs. GPs expressed that there is access inequity with bariatric surgery predominantly being an option for 'wealthy' patients.

Introduction

Obesity is a significant health issue worldwide with New Zealand (NZ) ranked the 3rd most obese nation in the OECD (1, 2). Obesity prevalence in NZ adults is 34.3%, with indigenous Māori population at 50.8% and Pacific at 71.3% (3). Obesity is a complex health concern, with a myriad of contributing factors, many of which are outside the bounds of general practice (4-7). However, obesity is reversible and preventable through a combination of dietary, exercise, and behavioural changes actioned in culturally appropriate ways (8). The Ministry of Health (MOH) positions primary care and general practice as best-suited to deliver weight management due to their frequent contact with patients and their ability to 'monitor, assess, manage and maintain' their patients weight and obesity risk (8).

Obesity rates are reportedly rising in recent decades (9), suggesting that potentially the current weight management model is ineffective. Given the known equity gap, finding effective approaches for reducing obesity for Māori and Pacific people should be a priority. Previous literature has highlighted that GPs experience difficulties in the 'delicate' discussion of weight, often utilising

opportunistic strategies in their practice (10). Barriers experienced included a lack of effective interventions, limited resource availability and obesity stigma (11). Bariatric surgery has mixed reviews with some GPs expressing the positive life-changing effects it has on some patients through weight loss and reduction of obesity comorbidities. However, other GPs consider this a drastic option that fails to deal with the root cause of the patient's obesity (11).

The current NZ model generally allocates GPs 15 minutes for a patient consult. Improved pathways to effective weight management are needed to help general practice deal with the obesity epidemic and its associated health impact on their patients given the limited time and resources they have at their disposal. The aim of this study was to explore GP perspectives of four areas to obesity management in Waikato general practice to help focus on areas for improving the care of adults with weight problems.

Methods

This study utilised a cross-sectional design. A questionnaire consisting of four multi-choice questions, each with a free text comment box, for participants to elaborate on why they chose their answers, was provided.

Participants

Participants were recruited in one of two ways. First, a small article and electronic link to participate in a Survey Monkey questionnaire was published in the Waikato District Health Board (WDHB) June 2021 newsletter. This was emailed to 494 GPs across the Waikato region and 17 participant responses were collected. Second, paper copies of the same questionnaire were handed out to all (n=18) GP attendees of an annual monthly Waikato GP meeting in Hamilton in July 2021, with 12 responses collected. No demographic data was collected.

Survey Development

The questionnaire consisted of four questions addressing GPs perspective on: deciding to raise weight in a consultation; preferred option to treating; their perspective on whether obesity management is a general practice issue; and their use of bariatric surgery. Due to obesity being such a complex and multi-levelled issue (1), a comment box was included for all questions so participants could elaborate on their experiences for qualitative analysis. This questionnaire was designed in collaboration with the Waikato DHB GP Liaison team. Descriptive statistics were used to analyse the quantitative data (12) and content analysis (13) was used for the qualitative comments. Ethical approval was granted by the University of Waikato Human Research Ethics Committee reference HREC2020#38.

Results

Table 1 details the Survey Questionnaire multiple choice results. Table 2 offers a selection of participant free text comment quotes, which, combined with the other quotes detailed in the sections below, form the findings of this study.

Table 5: Participant Responses to Survey Question One

Question 1: Susan is a 25 - 64 year old female who has a BMI over 35 and no significant comorbidities. If Susan visited you for another health matter- would you:	Participant responses (n=29)	Participant Response (%)
(A) Initiate a conversation about her weight	9	31.0
(B) Only discuss this topic if the patient asked for help	20	69.0
Total	29	100
Question 2: When offering weight management advice to a patient, how would you offer this intervention to the patient? Would you:	Participant Responses (n=29)	Participant Response (%)
(A) Offer this weight management advice yourself	24	82.8
(B) Refer the patient to the practice nurse	2	6.9
(C) Refer the patient to an outside agency or service? (e.g. commercial weight loss programme)	3	10.3
Total	29	100
Question 3: Do you believe tackling the obesity epidemic is a responsibility for general practice (as suggested by the Ministry of Health Clinical Weight Management Guidelines)?	Participant Responses (n=29)	Participant Response (%)
Yes	10	34.5
No	18	62.1
Participant who circled Yes and No (paper copy)	1	3.4
Total	29	100
Question 4: Have you referred a patient for bariatric surgery in the last 2 years?	Participant Responses (n=29)	Participant Response (%)
Yes	22	75.9
No	6	20.7
Skipped Question	1	3.4
Total	29	100
If so, was the outcome successful and weight loss achieved?		
Yes	13	45.0
Partially	5	17.2
No	3	10.3
N/A	7	24.1
Skipped Question	1	3.4
Total	29	100

Table 6: Selection of Participant Free-Text Comment Box Quotes

Question 1
“Only if there was time- weight issues require a lot of time to discuss” (Participant 12)
“I will talk weight with people I know. Been stung too many times raising this sensitive issue with strangers” (Participant 21)
“Depends entirely on what the other health matter are, e.g. if the presenting issue was weight related e.g. blood pressure, knee pain, diabetes, then I would discuss weight. But if she came in with stress/depression/anxiety then I would be unlikely to raise the issue of weight” (Participant 14)
Question 2
“Practice nurses are the best people. Nurse can refer the patient to outside agency or services” (Participant 28)
Question 3
“Patients should be made aware of obesity risks and should be educated on basic healthy lifestyle without having to see GP. Awareness campaigns need to be at population level. Treating obesity and supporting weight loss can be initiated by GP but ideally needs intensive follow-up. Very time-consuming, not possible in current rural practice setting” (Participant 03)
“I feel that general practice is already overwhelmed with everything else. It is too extensive to be just our responsibility. It needs involvement in various other places” (Participant 15)
Question 4
“Helpful but not financially accessible for many people” (Participant 17)
“The referral has not yet been successful. If people can pay (most can't) private is an option. But through the hospital, referring seems hopeless.” (Participant 06)

Comment Analysis

Question One

The majority of GPs (69%) reported that weight discussion was case dependant and would speak about weight if their patient asked (Table 1). Discussion of weight was reported as a *“very tricky topic to introduce”* (Participant 16) as there was a high *“risk of causing offense”* (Participant 07) which was positioned as something to avoid in their role as a GP. A lack of time available in the consultation, the quality of the GP-patient relationship, and how relevant weight was to the presenting health issue were all noted as factors in their decision.

Question Two

Whilst the majority (82.8%) of GPs indicated they would offer weight management themselves (Table 1), many commented that this was case dependant and *“depends on what patient wants”* (Participant 25) or the patients *“needs, finances, [and] motivation”* (Participant 06). Many participants highlighted that offering weight management advice was the first option ‘of many’ used and that referring patients was preferable for obesity management. Nine GPs positioned nurses as a common referral option as they have *“more time and more resources to offer patient”* (Participant 12).

Question Three

The majority (62.1%) of GPs did not believe tackling the obesity epidemic was their responsibility (Table 1). Obesity was positioned as a *“multifactorial problem with multifaceted management”* (Participant 18) needs. Whilst weight management was noted to have a place in general practice and with *“all healthcare professionals”* (Participant 26), with a *“shared”* (Participant 29) responsibility. It is *“a combined effort strategy”* (Participant 14) with patients, general practice, *“fast food control labelling”* (Participant 29), *“primary health care and public health”* (Participant 09) and national policy all having a responsibility.

Question Four

Most GPs (75.9%) reported referring a participant for bariatric surgery in the last two years (Table 1). Perspectives of the effectiveness of this intervention strategy varied. There was a significant theme of ‘caution’ towards the long-term success of the surgery by some participants and that it is *“good, but needs lifelong commitment”* (Participant 22). With *“limited availability via public funding”* (Participant 15) the surgery was commonly positioned as *“largely an option for the wealthy”* (Participant 14) whereby those who could fund the surgery personally or afford health insurance received the surgery.

Discussion

This study contributes new information to the GP perspectives of obesity healthcare situated in general practice warranting further exploration. The majority of GPs reported they would wait for their patient to raise the issue of their weight, would offer weight advice themselves as a first option before considering referral, did not view general practice as best suited in tackling the obesity epidemic, and utilised bariatric surgery as a referral option while noting the inequities in access.

Difficulties in discussing weight, options for referral and treatment were identified barriers to effective weight management in general practice, which supports similar studies in NZ (10, 11). Psychological and sociocultural factors have been recognised as contributing aspects to obesity

development (14-17), yet surprisingly, there was a lack of comments on how addressing these might facilitate discussion, referral or treatment options. One GP (Participant 14) specifically indicated that depression and anxiety would be a barrier to raising the issue of weight with a patient while physiological health concerns such as blood pressure or joint pain were more likely to trigger a discussion. Culturally appropriate healthcare is crucial for positive health changes, specifically with Māori and Pacific patients. However, this was not highlighted as a utilised referral option by these participants (18). Referrals to counsellors, psychologists or Māori/Pacific healthcare providers are effective obesity treatment options that were not recognised or were overlooked in this survey.

Bariatric surgery was found to be primarily an option for 'wealthy' patients indicating an additional layer to the inequity in access to this effective treatment. Recent literature has highlighted that in one area of NZ, Māori and Pacific populations are less likely to receive bariatric surgery compared with other ethnic groups, despite experiencing higher obesity (19). Whilst there have been recent discussions about best practice moving forward regarding Māori nutrition (20, 21), and identification of ethnic disparities across the board for publicly funded surgery (19, 22), there is evidence that obesity is a major health concern for all New Zealanders (1, 3, 23) and that solutions are urgently needed. Those living in socioeconomically deprived areas reportedly are 1.6 times more likely to be obese in NZ (3), and yet there are financial barriers in accessing this treatment suggesting an equity issue that needs to be addressed.

This study had a small sample size with no demographic data collected from participants. Whilst the findings cannot be generalised, the aim was to briefly explore GPs views and identify if more research is warranted in this context. The complex nature of obesity healthcare was stressed by these GPs. Many barriers are experienced in general practice and from the participant's perspectives effective treatment options are limited. Overall, this exploratory study found more guidance seems to be needed in how and when to raise the issue of obesity with patients and there is a need for a wider and more diverse availability of referral options, a better understanding of the resources needed to achieve effective weight loss and an examination of the inequities apparent in the access to bariatric surgery.

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Declaration of Funding

This project was part of a larger PhD project for Kimberley Norman (University of Waikato), which is funded by the Waikato District Health Board Research Trust.

No conflicts of interest

Data Availability Statement

Due to the small number of participants from a small geographical region of NZ, the data that supports this study cannot be publicly shared due to ethical and privacy reasons. The data may, however, be shared upon reasonable request to the corresponding author if appropriate.

References

1. World Health Organization. Obesity 2022 [cited 2022 24 January]. Available from: <https://www.who.int/topics/obesity/en/>.
2. Organisation for Economic Co-operation and Development (OECD). OECD Obesity Update 2017: OECD: Paris, France; 2017 [cited 2022 24 January]. Available from: <https://www.oecd.org/health/obesity-update.htm>.
3. Ministry of Health. Obesity Statistics 2021 [cited 2022 24 January]. Available from: <https://www.health.govt.nz/nz-health-statistics/health-statistics-and-data-sets/obesity-statistics>.
4. Swinburn B, Egger, G, and Raza, F. Dissecting obesogenic environments: the development and application of a framework for identifying and prioritizing environmental interventions for obesity. *Prev Med*. 1999; 29(6): 563-70.
5. World Health Organization. Social Determinants of Health: World Health Organization 2022 [cited 2022 24 January]. Available from: https://www.who.int/health-topics/social-determinants-of-health#tab=tab_2.
6. Howard NJ, Hugo GJ, Taylor AW, et al. Our perception of weight: Socioeconomic and sociocultural explanations. *Obes Res Clin Pract*. 2008; 2(2): 125-31.
7. Folkvord F. The Psychology of Food Marketing and (Over)eating. London, England: Routledge; 2019.
8. Ministry of Health. Clinical Guidelines for Weight Management in New Zealand Adults 2017 [cited 2022 24 January]. Available from: <https://www.health.govt.nz/publication/clinical-guidelines-weight-management-new-zealand-adults>.
9. Ministry of Health. Obesity 2022 [cited 2022 28 February]. Available from: <https://www.health.govt.nz/our-work/diseases-and-conditions/obesity>.
10. Gray L, Stubbe M, Macdonald L, et al. A taboo topic? How General Practitioners talk about overweight and obesity in New Zealand. *J Prim Health Care*. 2018; 10(2): 150-8.
11. Claridge R, Gray L, Stubbe M, et al. General practitioner opinion of weight management interventions in New Zealand. *J Prim Health Care*. 2014; 6(3): 212-220.
12. Frey B. Descriptive Statistics. 2018 In: The SAGE Encyclopedia of Educational Research, Measurement, and Evaluation [Internet]. Thousand Oaks, California. [cited 2022 24 January]. Available from: <https://methods.sagepub.com/reference/the-sage-encyclopedia-of-educational-research-measurement-and-evaluation>.
13. Frey B. Content Analysis. Thousand Oaks, California: SAGE Publications; 2018. [cited 2022 24 January]. Available from: <https://methods.sagepub.com/reference/the-sage-encyclopedia-of-educational-research-measurement-and-evaluation>.
14. Ball K, Crawford D, Jeffery R, et al. The role of socio-cultural factors in the obesity epidemic. *Obesity Epidemiology: from Aetiology to Public Health*. 2010; 2: 105-18.

15. British Psychological Society. Psychological perspectives on obesity: Addressing policy, practice and research priorities 2019 [cited 2021]. Available from: <https://www.bps.org.uk/news-and-policy/psychological-perspectives-obesity-addressing-policy-practice-and-research>.
16. Zhao G, Ford E, Dhingra S, et al. Depression and anxiety among US adults: associations with body mass index. *Int J Obes*. 2009; 33(2): 257-66.
17. Puhl RM, Himmelstein MS, Pearl RL. Weight stigma as a psychosocial contributor to obesity. *Am Psychol*. 2020; 75(2): 274.
18. Boulton A, Gifford H, Kauika A, et al. Māori Health Promotion: Challenges for best practice. *AlterNative: An International Journal of Indigenous Peoples*. 2011; 7(1): 26-39.
19. Rahiri J-L, Coomarasamy C, MacCormick A, et al. Ethnic disparities in access to publicly funded bariatric surgery in South Auckland, New Zealand. *Obes Surg*. 2020; 30(9): 3459-65.
20. Hawkins M. Were warriors once low carb? Commentary on New Zealand Māori nutrition and anthropometrics over the last 150 years. *J Prim Health Care*. 2021; 13(2): 106-11.
21. Hudson B, Pitama S, McBain L, et al. A brief response to Hawkins: a call for socially responsive research in Māori health. *J Prim Health Care*. 2021; 13(3): 204-6.
22. Rahiri J-L, Tuhoe J, MacCormick AD, et al. Exploring motivation for bariatric surgery among Indigenous Māori women. *Obes Res Clin Pract*. 2019; 13(5): 486-91.
23. Hawkins M. Let's focus on obesity New Zealand! *J Prim Health Care*. 2021; 13(4): 315-6.

Chapter 6: General Practitioner Interviews

Study 3: General Practitioner In-depth Qualitative Interviews

Overview

As highlighted in chapters 3 and 4, obesity is a complex health issue and ‘treating’ obesity can be a difficult task. Chapter 5 identified the potential for many barriers to delivering obesity healthcare within the general practice space and therefore, a more in-depth exploration of GP’s and other clinician’s views was warranted. This chapter shares the GP’s perspective of the perceived barriers to effective weight management within their practice.

Title: Barriers to Obesity Healthcare in General Practice from rural Waikato GP perspectives: a qualitative study.

Authors: Kimberley Norman, Lynne Chepulis, Lisette Burrows, and Ross Lawrenson

Disclosure Statement

This research was supported by the Waikato District Health Board Research Trust.

Author Contributions

KN involved with conceptualisation; investigation; methodology; project administration; data curation; formal analysis; writing original draft; writing review and editing. Lisette Burrows involved with; conceptualising; methodology; formal analysis; supervision; writing and reviewing. Lynne Chepulis involved with conceptualisation; methodology; supervision; writing review and editing. Ross Lawrenson involved with; funding acquisition; conceptualisation; methodology; supervision; writing review and editing.

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No conflicts of interests

Data Accessibility Statement

The datasets generated and analysed during the current study are not publicly available due to the small rural geographical location where data was collected and the potential for identifying participants. The datasets are available from the corresponding author on reasonable request.

Abstract

Objective: Over 34% of New Zealand (NZ) adults are obese, which reduces quality of life for many individuals. Those living in rural areas, high deprivation communities, and indigenous Māori populations are more likely to experience obesity and related comorbidities than other cohorts. General practice is positioned as most suitable to deliver effective weight management healthcare, however, little is understood about the rural general practitioner (GP) experience in NZ, despite having the majority of patients at high risk of developing obesity. The aim of this study was to investigate rural GP perspectives on barriers to delivering weight management.

Design: Qualitative descriptive design guided by Braun and Clarke (2006) using semi-structured interviews and analysed using deductive reflexive thematic approach.

Setting: Rural Waikato general practice which has significant rural, Māori and high-deprivation communities.

Participants: Six rural Waikato GPs.

Results: Three significant themes were identified: communication barriers, rural healthcare barriers, and social and cultural barriers. GPs reported not wanting to jeopardize the doctor-patient relationship by discussing weight. GPs felt unsupported by the health system through lack of rurally appropriate obesity intervention options, funding and resources. The unique rural lifestyle and health needs were reportedly not understood at wider health system level, making the role of a rural GP working in high-deprivation communities more difficult. Additional barriers to delivering effective weight management included factors outside the clinical practice such as obesity stigma, an obesogenic environment and sociocultural factors shaping rural patients' lives.

Conclusion: Rural GPs have a lack of weight management referral options that are considered effective for their patients, as the options available reportedly do not cater for their patients unique rural health needs. GPs position addressing the individualised and complex weight management health issue as challenging. Navigating stigma, wider sociocultural issues, and limited intervention options were difficult and found to be questionable to achieve in a short 15-minute consult. There is a need for rural health support in the form of funding, staff (indigenous and non-indigenous), and rurally feasible resources to improve health outcomes and reduce inequity. Effective primary care weight management strategies need to be appropriate for high deprivation rural communities, including tailored, affordable and reliable interventions that GPs can offer patients if future weight management efforts are to be successful in this space.

What is already known:

- Obesity is a complex multi-layered health issue for rural communities who already experience barriers to accessing healthcare, less resources than urban areas and healthcare inequities.
- Weight management is positioned to be best delivered in primary care, however despite weight management interventions available, obesity rates are increasing, suggesting there might be barriers to delivering obesity healthcare to rural patients.
- GP actioned weight management strategies in primary care are only one aspect of effective weight management (which generally deals with low and medium risk clients). There is also a specialist or secondary care approach (which addresses those at risk of serious negative health outcomes or premature death) and public health approach (which takes a population approach to reducing obesity where small changes to large numbers of people can have more significant impact than a large change in a small number of population).

What this paper adds:

- Rural GPs experience difficulties to providing adequate obesity healthcare through communication barriers, rural healthcare barriers, and factors outside the scope of general practice such as stigma and social determinants of health their patients experience.
- Rural GPs feel unsupported by their own health system through lack of support, funding, staff (indigenous and non-indigenous), resources or rurally feasible weight management intervention options to refer their patients to.
- Rural GPs working in high deprivation communities have been given little attention in weight management contexts in NZ despite having significant proportions of patients with or at risk of developing obesity. This study sheds light on the difficulties experienced and areas for improvement.

Introduction

Obesity is a significant health concern worldwide, with New Zealand (NZ) ranked the third most obese nation in the Organisation for Economic Co-operation and Development (OECD) (1) with 34% of NZ adults classed as obese (51% for indigenous Māori) (2). Obesity rates have continued to increase in recent history, with over 55% of the global rise in obesity reported to be from rural regions (from 1985-2017) (3). In NZ, rural communities and indigenous Māori reportedly experience higher obesity rates than their urban and non-Māori counterparts, and those living in the most deprived communities are 1.6 times more likely to be obese (2, 3). The most recent health survey (2002-2003) reported that rural females were more likely to be overweight or obese than urban females, while there was minimal difference between rural and urban males (4). However, despite there being no updated rural specific obesity prevalence figure, it is likely that the obesity rate has increased. As shown in more recent reports, many rural areas in NZ are classified as high-deprivation (2018) (5) and the 2020/2021 NZ health survey highlighted the overall adult obesity rate increased from 31.2% to 34.3 % in one year (6). Currently, one of the greatest impacts on rural health is obesity and its related physical (cardiovascular disease, type 2 diabetes and some cancers) and psychosocial (depression, social isolation, anxiety, body dissatisfaction and poor self-esteem) complications (6, 7). Rural areas are reported to experience more challenges with accessing primary healthcare than urban areas, with barriers such as rural geographical location, socioeconomic deprivation, transport, telecommunications and price of healthcare all contributing to the risk of obesity development (8). With over 600,000 people living in rural NZ (9), obesity is a significant health issue that is considered an epidemic (10) which is putting significant time, resource, and financial strain on the NZ health system.

Te Whatu Ora Health NZ (national health system) position primary healthcare professionals, specifically GPs, as best suited to deliver obesity healthcare in NZ due to the frequency in which they see their patients over long periods of time (11). Similar to other countries guidelines, including Australia, United Kingdom, Canada, and America (12-15), NZ GPs have support from the Clinical Guidelines for Weight Management in NZ adults (11) which outline best processes for delivery of obesity healthcare. This includes protocols for monitoring, assessing, managing, and maintaining weight as well as weight management strategies that can be referred to through general practice (11). Weight management strategies include evidence based dietary advice, very low calorie diets, meal replacements programmes, exercise programmes, commercial weight loss groups (such as Weight Watchers), tele-health or mobile programmes, weight loss medication or in significant cases bariatric surgery (11, 16-18) which is similar to other high-income countries (12-15). Obesity management strategies and their effectiveness in primary care have been explored previously,

suggesting that a combination of dietary control, exercise engagement, and behavioural changes actioned in culturally appropriate ways are positioned as 'best practice' (19). However, obesity is a complex health issue with a myriad of contributing factors, including social determinants of health, psychological health, sociocultural norms and political climates that shape individual lives (8, 20, 21). Identifying the appropriate weight management strategy that suits a patient is a complicated task as one weight management strategy 'does not fit all'.

While some previous literature has looked at the GPs perspective of weight management in primary care both overseas (22-29), and even less in NZ (30-33), these are predominantly in urban based practices with only a few including a small representation of rural GPs. Rural, high deprivation and indigenous groups (considered high-risk populations) have been given little attention in NZ, despite NZ increasing obesity rates. Perceived barriers to obesity healthcare in general practice are ineffective conversational strategies, stigmatisation of obesity, the extent of a GPs role or responsibility with obesity management, and system limitations (22, 23, 26, 30, 31). Some rural-only based Australian studies indicated that GPs experience communication difficulties when discussing weight in general practice and face challenges when delivering obesity healthcare (34, 35). However, there is limited understanding of the weight management barriers faced by rural GPs in NZ, specifically, in the rural Waikato region which has a significant Māori population (36). While the Clinical Guidelines for Weight Management (CGWM) in adults (11) indicates that GPs are positioned as best suited to manage obesity in their clinical practice, obesity is still a major health concern indicating there could be barriers within this space hindering weight management efforts. The national healthcare costs linked to obesity (and related comorbidities) were reportedly estimated at upwards of \$620 million, which is unsustainable for the current healthcare system (6, 37). Successful weight management is essential to reduce both obesity and comorbidity rates as well as improve quality of life for patients, and reduce health inequity between non-Māori and Māori populations in NZ. Research is needed in this area to identify barriers for GPs, improve quality of life for individuals with obesity, and reduce the strain on the health system.

Aim: The aim of this study was to investigate GP perspectives on obesity healthcare within rural Waikato general practices to identify any perceived barriers to, and experiences with, effective weight management interventions.

Method

Setting

This project focused on rural general practices in the Waikato region as demarcated by the Waikato District Health Board (DHB) and high-deprivation was classified as per NZ socioeconomic deprivation profile (5). The Waikato DHB has a population of over 425,000 and covers 21,000km², with 41% of the population residing in rural areas, and 23% of the population identifying as Māori (higher than the national average of 16%) (36). Waikato has a large tertiary hospital, four small rural hospitals and 75 general practices (36, 38) making this region suitable for exploratory obesity research. The definition of 'rural' has notably been a contested issue with some defining 'rural' using empirical data and descriptive driven methods, with others using socio-cultural driven methods (39, 40). For the purposes of this study, rural is defined as per the Geographical Classification of Health, which incorporates both data-driven and heuristic understandings of rural using a five-level rurality classification for health purposes (41).

Design

This study aimed to look in-depth at GP experiences and perspectives with weight management in rural general practice and therefore a qualitative descriptive design was most suitable as it enables a direct understanding of phenomenon from a range of health science contexts, including general practice (42, 43). The design was guided by Braun and Clarke qualitative research, specifically a deductive approach to thematic analysis (44, 45).

Participant Recruitment

Participant criteria consisted of currently, or having been, a practicing rural Waikato GP (as per the Waikato DHB boundary). Recruitment was carried out by sending a research information sheet and consent form detailing the study and what was expected from the participant to ten (out of 33 rural) general practices across the Waikato region via email. These general practices were purposefully selected to ensure a range of geographic and demographic features. Only ten practices were invited to minimise any extra burden and responsibility on an already strained rural GPs workforce through the COVID-19 pandemic. Practices who did not respond were followed up with an email one week later and a phone call two weeks later inviting them to participate. From these ten practices, six volunteered to take part in the study. Recruitment occurred during COVID-19 (May-August 2021) where the healthcare professionals were extremely busy. Participants included one female, one Māori GP and four NZ European male GPs and practices were located in six different rural towns and highlighted in Table 1 Below.

Table 1 Participant Demographics

Demographic	Participants (n)
Female	1
Male	5
Māori	1
Non-Māori	5

Data Collection

Once initial contact was made, any questions or concerns responded to by the researcher, and the participant had agreed to participate, a suitable interview time and location was arranged at the

convenience of the participant. The interviewing female researcher (Author 1) (who had comprehensive experience and training in qualitative interviewing) travelled to participants to minimise logistical barriers (46). Sites for interviews included rural general practices (3), local library (1) or via zoom (2) due to COVID-19 lockdown restrictions. Cultural considerations were accommodated by including time and space for prayer, karakia [Māori prayer], introductions, or other appropriate meeting opening/closing. At the time of the interview, the interviewer explained her background, reasons for the research and built rapport and relationships with participants. Participants were reminded of their rights to stop, pause, or withdraw from the study at any time. Once consent forms were signed and permission to audio record was granted, the interview commenced. Participants were given a \$30 voucher in recognition of their time.

Semi-structured interview questions were used to elicit data and field notes taken by researcher and guided from Braun and Clarke qualitative analysis (44, 45). These questions were open ended and whilst the interviews were guided by a set of questions, participants were able to take the conversation in directions that were relevant to them and their experiences. All interviews used an interview guide (designed by the multi-disciplinary research team Authors 1-4) which included questions such as: 'please tell me about your experience with delivering obesity or weight management healthcare in your practice?', 'could you please tell me about any barriers you have experienced with obesity healthcare in your practice?', 'from your perspective, please tell me about what you think is needed for effective weight management in general practice?'. All participants were encouraged to speak about their experience for as long as they wanted to. Interviews lasted between 25 to 60 minutes and were audio recorded for later verbatim transcription. Participants were thanked for their participation, offered to review transcripts (no participants did), and the interview was closed.

Analysis

Guided by Braun and Clarke (44, 45) a deductive approach to reflexive thematic analysis was used, whereby the coding and theme development were directed by the existing concept of 'barriers' (47). Transcripts were printed out, read, and re-read for immersion in the data by two researchers (Authors 1 and 2). Passages of text were highlighted for any form of 'barrier' expressed in the discourse. These passages were labelled as a type of barrier, and these labels became the codes. All codes were listed out, with any double ups, redundant or irrelevant removed. These codes were checked and used to form the six initial themes which were formed in collaboration discussion with all researchers (Authors 1-4). All transcripts were revisited to check these themes were evident in the data. While data saturation is positioned as subjective and situated (48), this analysis continued until the two researchers (Authors 1 and 2) agreed no new themes were identifiable in the data. From this, a total of three over-arching themes were found to be significant in participants' narratives.

A COREQ checklist was used to guide qualitative reporting. Ethical approval was granted by the University of Waikato Human Research Ethics Committee reference HREC2020#38.

Findings

Three significant barriers were found in this study; Communication Barriers, Rural Healthcare Barriers, and Social and Cultural Barriers.

Communication Barriers

Obesity was recognised to be a stigmatised health concern with GPs suggesting that raising the weight management topic with their patients ran the risk of causing offense. Whilst there are “lots of ways that you can address weight measurement” (Participant 04), GPs reported a sense of caution, sometimes being “too frightened” (Participant 05) or too “uncomfortable about talking about weight” (Participant 01). As one GP described it:

“I do think there is the murkiness of offending somebody, but also those health concerns makes it a trickier thing to do, particularly in the general practice model” (Participant 06)

These rural GPs were often the only or one of a few GPs servicing the local rural areas and highlighted that maintaining positive relationships was crucial for best practice. As expressed by one GP:

“I think that relationship is one of the real keys to general practice. It's different from hospital medicine, where people come in there might be seeing anyone” (Participant 03)

How to approach the topic of weight management was “incredibly important” (Participant 04). Using appropriate non-accusatory and non-blaming language in the discussion was positioned as important to not jeopardize the therapeutic relationship. The risk of causing offense was described by one GP as:

“not something you want to do if you want to maintain a relationship with a patient” (Participant 05).

GPs found linking weight management discussions to disease management was a useful way to ‘justify’ broaching the subject with their patients to avoid perceived stigma. Raising or discussing the topic of weight was reported to be commonly linked to diabetes management, avoiding extra medication or comorbidities, cardiovascular risk screening (Participant 03) and wellness checks (Participant 04).

For these GPs, discussing health risks were positioned as a key part of their professional role to improve their patients health, however, when to raise the topic of weight management was described as difficult. As highlighted by one GP:

“You do have to bring it up. But it's often better that they bring it up than you bring it up. But you still- it still has to be addressed. So at some point, you need to talk about it. And I mean, it's a bit like smoking, you have to bring it up, even though you both know it's there. You actually have to say it. Because if you don't say it, then you're not going to make any progress in it” (Participant 02)

GPs reported obesity to be a multileveled concern, with weight management linked to multiple layers of a patient's overall health, which as described by one GP, can take time to address over multiple consultations:

"[Weight] needs to be a conversation over about probably at least four if not 20 consults before you actually really dive into what's going on" (Participant 06)

Rural Healthcare Barriers

GPs reported many barriers to effective weight management that were related to rural locality and difficulties in accessing obesity healthcare. While a lack of funding, staff and resources were highlighted by all participants as key barriers, a further hinderance was rural location, as indicated by one GP:

"Rurally of course there are a lot less facilities than urban" (Participant 05)

One GP highlighted that their rural practice is *"not really looking to the District Health Board"* for assistance because the help would not be useful, as their town is *"quite a distance from anywhere"* (Participant 03). While another GP noted the distance and lack of funding was a barrier:

"[There is] not a lot of support from the district health board around it. The money is not there" (Participant 05)

Accessing healthcare staff rurally for weight management was noted to have reduced in their rural areas, as highlighted by two GPs:

"But the services have got cut right back so we don't have that now- the district nurses."
(Participant 03)

"Actual nutritionists or dietitians, were very, very rare coming out from [main town] and they would come as far as [next main town]" (Participant 05)

Dietitians were positioned as a useful referral option, however, again, there was a *"lack of access to trained dietetics"* (Participant 06). Limited availability for GPs to access a dietitian rurally was also noted by two GPs:

"We can't refer to a dietitian, just because people want to lose weight. I mean, those dietary services, dieticians just aren't available" (Participant 02)

"It would be great to get a dietitian [to be available]" (Participant 03)

Other weight management options including CGWM, commercial 'Weight Watcher' programmes, medication and bariatric surgery were positioned as useful for some patients. However, GPs reported that commercial support groups were not available in their local rural town, medication

had multiple side effects, and the cost associated with many options exceeded their patients financial ability. Nutritional guidelines were positioned as available, however, any dietary advice the GP gave their patient directly was described as *“rudimentary stuff”* (Participant 02) and usually it was generalised as *“simple dietary advice”* (Participant 02).

One GP highlighted the difficulties in giving effective dietary advice in a consult when the patient was dealing with co-morbidities (commonly seen with obesity) that had contradicting nutritional recommendations:

*“All of our food guidelines are conflicting because they're disease specific, almost like ‘here's the guidelines for diabetes, here's the guidelines for cardiovascular, here is the guideline for gout’. And so we're telling them to eat green leafy vegetables and we telling them not to eat brassicas, and the patient's going well, f**k it I'll go have some KFC because I'm feeling bad, because I failed again. You know, we have a bad day and we go and eat some chocolate because it makes us feel better. And the cardiologist telling you, you're going to die because your heart attack and the rheumatologist telling you your gout is bad because you're eating broccoli, but you're eating the broccoli to try and get your diabetes under control. You just 'ahhh”* (Participant 06)

One GP expressed bariatric surgery to be the *“ambulance at the bottom of a cliff”* and a *“completely inefficient way to deal with it [obesity]”* (Participant 02). Surgery was viewed positively for certain *“motivated”* (Participant 02) patients whereby they can get surgery and *“come off half the medications”* (Participant 06) thereby improving health outcomes. However, some GPs also recognised the complexities of obesity and that surgery was sometimes used as *“quick fix and doesn't fix the underlying problems”* (Participant 06). As one GP described:

“a lot goes with it [psychologically], you don't just get the surgery to get better” (Participant 03).

The psychological element of obesity was stressed as a significant barrier by some GPs. One participant described some patients having *“a real addiction for sugar”* (Participant 03), while another noted *“trauma”* or *“some kind of childhood abuse”* (Participant 04) as underlying contributors to unhealthy eating behaviours.

One GP highlighted there were minimal weight management referral options in primary care that included the psychological component. Further to this, the main available option was not located rurally, causing additional barriers for the GP to deliver effective weight management care:

“The only referral option that we have is the adult weight management clinic, which was is at [nearest city] hospital, which is multidisciplinary, and involves psychologists as well, because of course, there is a whole psychological component of weight loss, which is massive” (Participant 04)

Due to the lack of indigenous and non-indigenous staff, resources and funding, the role of a rural GP was positioned as varied and comprehensive. Weight management was identified to need

comprehensive attention with accessible and effective referral options available for their rural patients. As one participant described:

“And in fact, as clinicians, we're the only ones who really can sort out the medication. So that has to be a priority for us. And the health and wellness stuff really needs to move into an area where it can be done more effectively with longer periods of time. At a rate at which that person can engage as well. So not 10 minutes. You know, it's not useful to [just] tell somebody that they've got to lose weight” (Participant 04)

GPs expressed that rural living and rural lifestyles were not understood by the health system. These rural GPs had many patients living in high-deprivation households and any weight management options they were eligible for, they had difficulty accessing. This caused difficulties for rural GPs to improve patient health when resources were not suitable for some of their rural patients, as described by one GP:

“I think there's absolutely no knowledge of rural healthcare needs at all levels of the system other than rural. So certainly not at the Ministry level very little at the DHB or PHO level even. And I think that hospital services don't really, really get what an issue it is. For people who don't have a car, don't have a rego [registration] on their car. Don't have any bus service or train service have little cell phone cover, or internet cover. And somehow or another they've got to get to hospital appointment once a week” (Participant 04)

Another GP detailed that working rurally came with challenges whereby: *“rurally, we've had pretty much no access to any other resources”* and that the available treatment options *“doesn't really work, rurally”* (Participant 04).

Social and Cultural Barriers

GPs expressed significant awareness at the social and cultural aspects that can act as barriers to effective weight management. GPs stressed that it was difficult to find effective weight management strategies for their patients when they lived in obesogenic environments, with high concentration of fast food outlets (Participant 06), only one green grocer and one (or no) gym facility (Participant 02). One GP highlighted that commercial marketing tactics made the theoretical ‘healthy eating’ advice he gave more difficult for patients to achieve in practice:

“I guess the manufacturers have discovered if you put that amount [of sugar] in, you're gonna sell it better” (Participant 03)

Social determinants of health were also identified to play a significant role in managing weight. Patient’s lifestyle, employment type, family ‘norms’, learned behaviours, and national policies were all barriers to obesity healthcare, as described by three GPs:

“The long distance, lorry drivers and people like that, who just are sitting on the bottom all day. And so junk food is easy thing to eat. And exercise becomes an impossible thing to do too. There's just so many big components” (Participant 04)

“If your family is brought up on takeaway foods all the time then. It’s difficult to break out of it [takeaway cycle behaviour]” (Participant 05)

“That’s before we even get into the widening inequalities and socio-economic stuff that drives the cause of [obesity]. You know, the price of food, the price of housing and all the rest of the underlying causes, which health isn’t even set up to deal with” (Participant 06)

The normalisation of obesity was reported to act as a barrier whereby patients would not identify as being ‘obese’, making the GPs role of delivering weight management advice difficult. As one GP indicated:

“our society’s perception of what’s normal is actually been distorted” (Participant 02)

Cultural aspects were highlighted to be significant to the effectiveness of weight management, particularly for indigenous populations. GPs acknowledged that there were potential power imbalances that could act as barriers to providing effective weight management healthcare to their patients. Avoiding stigmatising or judgemental language or treatment was crucial to maintain a strong GP-patient relationship, particularly with non-Māori GPs and Māori patients. This included self-awareness of their own non-Māori culture and ‘thin privilege’ as detailed by two GPs:

“If you’re tangata whenua [indigenous people of the land], and you’re very overweight, and you’ve got multiple health issues and poverty issues, you’re gonna find it much harder to take advice from my skinny white [doctor] aren’t you really” (Participant 04)

“I’m conscious I’m the skinny Pakeha and I’m trying to advise a lot of our patients [who] are overweight and Māori, and so, especially Māori community here, and there’s a lot. I think for some of these people, what authority do I have to say anything? How would I understand? If you’re on a low-income level, and you’re buying the sort of foods you’re buying for your family [which] aren’t always the healthiest. I’m conscious of not wanting to come across as being judgmental” (Participant 03)

One GP highlighted that having a lack of Māori healthcare professionals available in their rural town was a barrier in the past, particularly for his Māori patients seeking healthcare. However now, they have a “trusted” Māori community member who grew up in their rural town (as opposed to a visiting healthcare worker) which was “a huge advantage” (Participant 03) for strong relationship building, knowledge sharing, and improving health outcomes with their Māori communities.

Lack of public health awareness or education aspects to obesity healthcare also hindered the work of these GPs. One participant stressed that “we need a public health campaign” about healthy lifestyles, but “without ostracizing people” (Participant 06).

Another GP stressed the need for:

“Recognizing all the different components that impact upon weight, including spiritual, mental, physical health, and financial and social well-being, education, health literacy”
(Participant 04)

One GP described that *“we probably need to look at a different way of trying to get the message across”* (Participant 02) in a way that is relevant to the participant. Language that is culturally specific was also identified as useful for improving health outcomes.

Overall, GPs expressed feelings of being *“completely unsupported!”* (Participant 04) when delivering weight management healthcare in rural general practice. Taking into account the nuanced communication difficulties, rural healthcare issues and social and cultural contexts to navigate which are outside the scope of general practice, one GP summed it up as there is:

“no way that that's manageable by a GP [alone]” (Participant 04)

Discussion

This study explored rural GPs experiences with barriers to weight management healthcare delivery in primary care and identified three major themes: communication barriers, rural healthcare barriers, and social and cultural barriers.

The communication barriers found in this study were predominantly orientated around the notion of maintaining positive therapeutic relationships with patients. This was associated with by not offending patients due to the stigmatised nature of obesity. These findings share similarities with previous literature both urban practice based (22, 24) and rural practice based (34, 35) which identify barriers to include time constraints, avoiding offensive or stigmatising language, and the need to not jeopardise the therapeutic relationship. However, this study found additional barriers to communication that extend previous literature. The GPs in this research were working in rural and often high-deprivation communities, with large proportions of indigenous communities. The GPs were found to be sensitive to the potential power imbalances that could hinder health improvements and actively worked to minimise this threat to the therapeutic relationship with patients. While the concept of power imbalances is not a new phenomenon (49), this research extends this knowledge and demonstrates that the multi-layered nature of power imbalances is evident with weight management in the rural primary care context. These GPs were aware of socio-economic and cultural power differences (specifically with Māori patient and non-Māori GP) during their consultations and attempted to minimise these for their patients. However, effectively addressing potential power imbalances in addition to the complex nature of weight management (which is different for every patient) within a short 15-minute consultation is a questionable task for GPs to achieve, supporting previous literature (23).

Rural healthcare barriers included a lack of funding, staff shortages, lack of indigenous health professionals, lack of weight management resources in rural communities, lack of effective referral options, and a strong sense of little support for GPs working in high-deprivation rural communities. These findings are understandable given the current health staff shortage in NZ currently impacting urban and rural practices (50, 51). These findings support previous similar rural health literature

which indicates access barriers due to geographical location, less funding or resources are present (9, 46, 52). However, the GPs in this study offered a novel perspective to rural healthcare where (for weight management) they are working within a different environmental and resource climate than that of urban practices, a concept which was reportedly not understood by the wider national health system. High-deprivation communities often are dealing with multi-levelled determinants of health, which can impact obesity (20, 53-56) including psychological factors (21, 57, 58) making effective weight management more difficult for a GP to deliver. Previous literature has suggested that addressing psychological, behavioural and spiritual health (specifically in indigenous populations) can have positive impacts on weight management long-term (21, 59) which this study offers support for in the rural and high-deprivation NZ context. These GPs stressed a lack of obesity related psychological referral options, support in their roles, or recognition about the challenges of rural healthcare from a wider health system perspective. At the time of this research NZ is experiencing large scale health reforms (60). After much debate and initially not recognising rural as a separate entity, Te Whatu Ora Health NZ has since acknowledged rural to be a health sector in its own right (thanks to the Rural Health Alliance Network (9)), reflecting the significance and need of rurally tailored weight management options that are called for through these GPs narratives.

Social and cultural factors, which were often situated outside the general practice context, were reported to be additional barriers acting on weight management healthcare. This study identified that for rural GPs, factors such as social determinants of health, the 'normalisation' of obesity, pervasive marketing of sugar, and varying sociocultural norms present within the unique cultural NZ population contributed to the challenges for GPs to deliver weight management healthcare. These findings offer support for the more macro-level contributors to obesity (8, 20, 56, 61, 62). However, these findings also shed light on how these factors are present and can compound for high-deprivation rural communities in NZ, making the role of a rural GP difficult when tasked with attempting to deliver effective weight management in their practice. The obesity health issue cannot be viewed in isolation due to the many contributing factors and this study extends this finding to include the high deprivation rural communities of NZ who are living in unique indigenous and non-indigenous socio-cultural climates impacting weight management.

Recommendations for Future Research, Practice and Policy

The findings from this study indicate several avenues that should be explored to improve weight management related health outcomes in the future. Rural GPs indicated a lack of rurally tailored resources that are within the financial or physical reach of patients in their high-deprivation communities. Further investigation into how to better support rural GPs working in the weight management primary care context in high deprivation communities is recommended. This support could include identifying ways to communicate weight management in a non-stigmatising manner, offer effective rurally accessible intervention options, and offer more staff and funding to help the strained rural health workforce. This research found that the role of a GP experienced multiple layers of barriers to delivering weight management, much of which was considered outside the scope of their practice. Investigation into whether weight management is suitable for a GP workload is warranted, as this research found this to be questionable in the rural context. National policy should look to work with rural health professionals (and their communities) to establish best practice guidelines that benefit the unique rural lifestyle, accommodate for additional access barriers, and reduce health inequities experienced. More research is needed to address the lack of access, support, resources, and reliability of obesity healthcare services for rural populations.

Limitations

As with any qualitative study, the findings are not generalisable. However, this study aimed to explore the perspectives of rural Waikato GPs, who are already a small homogenous sample to elicit data from, and are transferable to other high deprivation rural general practices across NZ. Due to COVID-19 restrictions only six out of ten GPs were able to participate (one female, one Māori and no Pacific Island representation). The small sample size does limit the scope in findings and increasing the number of participants, including more female, Māori and Pacifica GPs could generate more nuances across the narratives. However, data saturation was considered to be reached with no new themes emerging from GP narratives through preliminary analysis during data collection phase (Authors 1 and 2) or after revisiting transcripts in the analysis phase (by Authors 1-4). Whilst this research did include a Māori participant, was guided by a cultural advisor, and utilised two data researchers with a reflexive approach, a Kaupapa Māori methodology could elicit richer Māori data and findings relevant to the Māori population.

Conclusion

Rural GPs experience significant barriers delivering obesity healthcare to their patients due to communication barriers, rural healthcare barriers, and the social and cultural climates their patients live in. Rural GPs have a lack of effective weight management referral options for their patients, as the ones available reportedly do not cater for their patients unique rural health needs, despite being at high risk for obesity. GPs position the complex obesity health issue as difficult to comprehensively treat within their practice and stressed the need for more support in the form of funding, staff (indigenous and non-indigenous), and rurally feasible resources to improve health outcomes and reduce inequity. Effective primary care weight management strategies need to be appropriate for high deprivation rural communities. This includes tailored, affordable and reliable interventions that GPs can offer patients (via referral or through their own practice) if weight management efforts are to be successful in this space in the future.

Data Accessibility Statement

The datasets generated and analysed during the current study are not publicly available due to the small rural geographical location where data was collected and the potential for identifying participants. The datasets are available from the corresponding author on reasonable request.

References

1. Organisation for Economic Co-operation and Development (OECD). OECD Obesity Update 2017: OECD: Paris, France; 2017. Available from: <https://www.oecd.org/health/obesity-update.htm>
2. Ministry of Health. Obesity Statistics. 2021. Available from: <https://www.health.govt.nz/nz-health-statistics/health-statistics-and-data-sets/obesity-statistics>
3. NCD Risk Factor Collaboration. Rising rural body-mass index is the main driver of the global obesity epidemic in adults. *Nature*. 2019;569(7755):260.
4. Triggs S, Mason K, Borman B. Urban-rural Health Comparisons: Key Results of the 2002/03 New Zealand Health Survey: Ministry of Health; 2007.
5. Environmental Health Indicators New Zealand. Socioeconomic deprivation profile 2018. Available from: [https://ehinz.ac.nz/indicators/population-vulnerability/socioeconomic-deprivation-profile/#:~:text=New%20Zealand%20Index%20of%20Deprivation%20\(NZDep\),-The%20NZDep%20is&text=It%20measures%20the%20level%20of,small%20areas%20in%20New%20Zealand](https://ehinz.ac.nz/indicators/population-vulnerability/socioeconomic-deprivation-profile/#:~:text=New%20Zealand%20Index%20of%20Deprivation%20(NZDep),-The%20NZDep%20is&text=It%20measures%20the%20level%20of,small%20areas%20in%20New%20Zealand)
6. Ministry of Health. Obesity. 2022. Available from: <https://www.health.govt.nz/our-work/diseases-and-conditions/obesity>
7. World Health Organization. Obesity and Overweight. 2021. Available from: <https://www.who.int/en/news-room/fact-sheets/detail/obesity-and-overweight8>. Brewis AA. Obesity: Cultural and biocultural perspectives: Rutgers University Press; 2010.
9. Rural Health Alliance Aotearoa New Zealand. RHAANZ Rural Health Road Map 2019. Available from: <https://rhaanz.org.nz/wp-content/uploads/2019/11/Rural-Health-Road-Map-2019.pdf10>.
World Health Organization. Obesity. 2021. Available from <https://www.who.int/topics/obesity/en/>
11. Ministry of Health. Clinical Guidelines for Weight Management in New Zealand Adults 2017. Available from: <https://www.health.govt.nz/publication/clinical-guidelines-weight-management-new-zealand-adults>
12. National Health and Medical Research Council. Clinical Practice Guidelines for the management of overweight and obesity in adults, adolescents and children in Australia 2013. Available from: <https://www.nhmrc.gov.au/about-us/publications/clinical-practice-guidelines-management-overweight-and-obesity>

13. Obesity Canada. Canadian Adult Obesity Clinical Practice Guidelines: Obesity Canada; 2022. Available from: <https://obesitycanada.ca/guidelines/chapters/>
14. Moyer VA. Screening for and management of obesity in adults: US Preventive Services Task Force recommendation statement. *Ann Int Med.* 2012;157(5):373-8.
15. National Institute for Health and Care Excellence (NICE). Weight management: lifestyle services for overweight or obese adults. Public health guideline [PH53]: NICE; 2014. Available from: <https://www.nice.org.uk/guidance/ph53>
16. Hebden L, Balestracci K, McGeechan K, Denney-Wilson E, Harris M, Bauman A, Allman-Farinelli M. 'TXT2BFiT' a mobile phone-based healthy lifestyle program for preventing unhealthy weight gain in young adults: study protocol for a randomized controlled trial. *Trials.* 2013;14(1):1-0.
17. Te Morenga L, Pekepo C, Corrigan C, Matoe L, Mules R, Goodwin D, Dymus J, Tunks M, Grey J, Humphrey G, Jull A. Co-designing an mHealth tool in the New Zealand Māori community with a "Kaupapa Māori" approach. *AlterNative: An International Journal of Indigenous Peoples.* 2018;14(1):90-9.
18. Gudzone KA, Doshi RS, Mehta AK, Chaudhry ZW, Jacobs DK, Vakil RM, Lee CJ, Bleich SN, Clark JM. Efficacy of commercial weight-loss programs: an updated systematic review. *Ann Int Med.* 2015;162(7):501-12..
19. Norman K, Chepulis L, Burrows L, Lawrenson R. Adult obesity management in New Zealand general practice: a review. *J Prim Health Care.* 2021;13(3):249-59.
20. World Health Organization. Social Determinants of Health: World Health Organization; 2022. Available from: https://www.who.int/health-topics/social-determinants-of-health#tab=tab_2
21. British Psychological Society. Psychological perspectives on obesity: Addressing policy, practice and research priorities 2019. Available from: <https://www.bps.org.uk/news-and-policy/psychological-perspectives-obesity-addressing-policy-practice-and-research>
22. Blackburn M, Stathi A, Keogh E, Eccleston C. Raising the topic of weight in general practice: perspectives of GPs and primary care nurses. *BMJ Open.* 2015;5(8):e008546.
23. Epstein L, Ogden J. A qualitative study of GPs' views of treating obesity. *Br J Gen Pract.* 2005;55(519):750-4.
24. Jansen S, Desbrow B, Ball L. Obesity management by general practitioners: the unavoidable necessity. *Aust J Prim Health.* 2015;21(4):366-8.

25. Kim KK, Yeong L-L, Caterson ID, Harris MF. Analysis of factors influencing general practitioners' decision to refer obese patients in Australia: a qualitative study. *BMC Fam Pract.* 2015;16:1-8.
26. Sonntag U, Brink A, Renneberg B, Braun V, Heintze C. GPs' attitudes, objectives and barriers in counselling for obesity—a qualitative study. *Eur J Gen Pract.* 2012;18(1):9-14.
27. Teixeira PJ, Carraça EV, Marques MM, Rutter H, Oppert JM, De Bourdeaudhuij I, Lakerveld J, Brug J. Successful behavior change in obesity interventions in adults: a systematic review of self-regulation mediators. *BMC Med.* 2015;13(1):1-6.
28. Ashman F, Sturgiss E, Haesler E. Exploring self-efficacy in Australian general practitioners managing patient obesity: a qualitative survey study. *Int J Fam Med.* 2016;2016.
29. Schwenke M, Luppá M, Pabst A, Welzel FD, Löbner M, Luck-Sikorski C, Kersting A, Blüher M, Riedel-Heller SG. Attitudes and treatment practice of general practitioners towards patients with obesity in primary care. *BMC Fam Pract.* 2020;21(1):1-8.
30. Claridge R, Gray L, Stubbe M, Macdonald L, Tester R, Dowell AC. General practitioner opinion of weight management interventions in New Zealand. *J Prim Health Care.* 2014;6(3):212-220.
31. Gray L, Stubbe M, Macdonald L, Tester R, Hilder J, Dowell AC. A taboo topic? How General Practitioners talk about overweight and obesity in New Zealand. *J Prim Health Care.* 2018;10(2):150-8.
32. Patel A, Schofield GM, Kolt GS, Keogh JW. General practitioners' views and experiences of counselling for physical activity through the New Zealand Green Prescription program. *BMC Fam Pract.* 2011;12:119.
33. Norman K, Chepulis L, Campbell F, Burrows L, Lawrenson R. Waikato GP perspectives on obesity management in general practice: a short report. *J Prim Health Care.* 2022;14(2):146-50.
34. Glenister KM, Malatzky CA, Wright J. Barriers to effective conversations regarding overweight and obesity in regional Victoria. *Aust Fam Physician.* 2017;46(10):769.
35. Malatzky C, Glenister K. Talking about overweight and obesity in rural Australian general practice. *Health Soc Care Community.* 2019;27(3):599-608.
36. Te Whatu Ora Health New Zealand. Snapshot of Te Whatu Ora Waikato 2023. Available from: <http://www.waikatodhb.govt.nz/about-us/snapshot-of-waikato-dhb/>
37. Lal A, Moodie M, Ashton T, Siahpush M, Swinburn B. Health care and lost productivity costs of overweight and obesity in New Zealand. *Aust N Z J Public health.* 2012;36(6):550-6.

38. University of Waikato. Rural Health 2022. Available from: <https://www.waikato.ac.nz/huataki-waiora-health/research/medical-research-centre/rural-health>
39. Woods M. Rural Geography: Processes, Responses and Experiences in Rural Restructuring. London. 2011. Available from: <https://sk.sagepub.com/books/rural-geography>
40. Halfacree KH. Locality and social representation: space, discourse and alternative definitions of the rural. *J Rural Studies*. 1993;9(1):23-37.
41. Whitehead J, Davie G, de Graaf B, Crengle S, Fearnley D, Smith M, Lawrenson R, Nixon G. Defining Rural In Aotearoa New Zealand: A Novel Geographic Classification For Health Purposes. 2021. Available from: <https://www.researchsquare.com/article/rs-817117/v1>
42. Sandelowski M. Whatever happened to qualitative description?. *Res Nurs Health*. 2000;23(4):334-40.
43. Willis DG, Sullivan-Bolyai S, Knafk K, Cohen MZ. Distinguishing features and similarities between descriptive phenomenological and qualitative description research. *West J Nurs Res*. 2016;38(9):1185-204.
44. Braun V, Clarke V. Using thematic analysis in psychology. *Qual Res Psychol*. 2006;3(2):77-101.
45. Braun V, Clarke V. Can I use TA? Should I use TA? Should I not use TA? Comparing reflexive thematic analysis and other pattern-based qualitative analytic approaches. *Couns Psychother Res*. 2021;21(1):37-47.
46. Davis-Wheaton J. Breaking down health barriers in rural areas. *Kai Tiaki: Nursing New Zealand*. 2013;19(2):2.
47. Braun V, Clarke V. Successful qualitative research: A practical guide for beginners. London, England: Sage; 2013.
48. Braun V, Clarke V. To saturate or not to saturate? Questioning data saturation as a useful concept for thematic analysis and sample-size rationales. *Qual Res Sport Exerc Health*. 2021;13(2):201-16.
49. Goodyear-Smith F, Buetow S. Power issues in the doctor-patient relationship. *Health Care Anal*. 2001;9(4):449-62.
50. Cate Broughton. Doctor shortage forcing GP clinics to turn away new patients. Stuff. 2021. Available from: <https://www.stuff.co.nz/national/health/124477572/doctor-shortage-forcing-gp-clinics-to-turn-away-new-patients>

51. Gooch C. Nationwide GP shortage a 'workforce' and 'workload' issue. Stuff. 2021. Available from: <https://www.stuff.co.nz/national/health/126040965/nationwide-gp-shortage-a-workforce-and-workload-issue>
52. National Health Committee. Rural Health Challenges of Distance Opportunities for Innovation 2010. Available from: <http://www.nhc.health.govt.nz>
53. Dinsa GD, Goryakin Y, Fumagalli E, Suhrcke M. Obesity and socioeconomic status in developing countries: a systematic review. *Obes Rev.* 2012;13(11):1067-79.
54. Kim MY, Oh J-K, Lim MK, Yun EH, Kang YH. The association of socioeconomic and psychosocial factors with obesity in a rural community. *Korean J Obes.* 2012;21(1):18-28.
55. Ogden CL, Lamb MM, Carroll MD, Flegal KM. Obesity and socioeconomic status in adults: United States, 2005-2008: US Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Health Statistics. 2010.
56. Swinburn B, Egger G, Raza F. Dissecting obesogenic environments: the development and application of a framework for identifying and prioritizing environmental interventions for obesity. *Prev Med.* 1999;29(6):563-70.
57. Hill A, Williams G, Fruhbeck G. Social and psychological factors in obesity. *Obesity: Science to practice.* 2009;347-66.
58. Zhao G, Ford ES, Dhingra S, Li C, Strine TW, Mokdad A. Depression and anxiety among US adults: associations with body mass index. *Int J Obes.* 2009;33(2):257-66.
59. Ministry of Health. Māori health models. 2015. Available from: <https://www.health.govt.nz/our-work/populations/maori-health/maori-health-models>
60. New Zealand Government. Pae Ora (Health Futures) Bill 2022. Available from: <https://legislation.govt.nz/bill/government/2021/0085/latest/LMS575405.html>
61. Folkvord F. *The Psychology of Food Marketing and (Over)eating.* London, England: Routledge; 2019.
62. Brewis AA, McGarvey ST, Jones J, Swinburn BA. Perceptions of body size in Pacific Islanders. *Int J Obesity.* 1998;22(2):185-9.

Chapter 7: Nurse Interviews

Study 3: Nurse In-depth Qualitative Interviews

Overview

This chapter extends the view of general practice clinicians to nurses as they have a crucial role in general practice healthcare delivery. The view of nurses is important to explore as they have significant interaction with clients in their practice. This chapter offers valuable insights into the experiences of rural nurses which has not been explored in the rural Waikato region before with regards to obesity management.

Title: *“They're all individuals, none of them are on the same boat”: Barriers to Weight Management in General Practice from the Rural Nurse Perspective*

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Abstract

Aim: To explore nurses' experiences with, and barriers to, obesity healthcare in rural general practice.

Background: Obesity is a significant health risk worldwide which can lead to many other physical and psychosocial health issues that contribute to a poor quality of life. Primary care is considered the most suitable context to deliver obesity management healthcare across the world, including New Zealand, which reportedly has 34% of all adults (and 51% Indigenous Māori) classed as obese. Nurses in primary care have a significant role in the multi-disciplinary team and deliver obesity healthcare in general practice contexts. Yet, there is little focus on the nurse perspective of weight management, specifically in rural areas where medical staff and resources are limited, and obesity rates are high.

Methods: This was a qualitative research design. Semi-structured interviews with 10 rural nurses from indigenous and non-indigenous health providers were analysed guided by Braun and Clarke (2006) approach thematic analysis.

Findings: Three themes were identified: Limitations of a Nurse Role; Patient-level Barriers; and Cultural Barriers. Nurses reported experiencing significant barriers to delivering effective weight management in their practice due to factors outside the scope of their practice such as patient level factors, social determinants of health, rural locality restrictions and limitations to their role. While this study highlights that practice nurses are versatile with an invaluable skill repertoire, it also demonstrates the near impossibility for rural nurses to meet their rural patient's complex weight management needs, as there are many social determinants of health, sociocultural and rural locality factors acting as barriers to effective weight management. Nurses experienced a lack of systemic support in the form of time, resources, funding, and effective weight management referral options. Future investigation should look to address the unique rural weight management healthcare needs that experience many barriers.

Keywords: Nursing, Weight Management, Primary Care, Indigenous, Obesity Healthcare, Nurse Experience, Inequity

Introduction

Obesity is a significant health issue worldwide, with New Zealand (NZ) ranked the third most obese nation in the Organisation for Economic Co-operation and Development (OECD) (Organisation for Economic Co-operation and Development (OECD), 2017) with 34% of NZ adults classed as obese (51% for indigenous Māori and 71% Pacific) (Ministry of Health, 2021a). In recent history, obesity rates have consistently increased, with over 55% of the global rise in obesity reported to be from rural regions (from 1985-2017) (NCD Risk Factor Collaboration, 2019). In NZ, rural communities and indigenous Māori are reported to have higher rates of obesity than their urban and non-Māori counterparts, and those living in the most deprived communities are 1.6 times more likely to be classed as obese (Ministry of Health, 2021a; NCD Risk Factor Collaboration, 2019). The most recent (2002-2003) NZ health survey reported that rural females were more likely to be overweight or obese than urban females, while there was little difference between urban and rural males (Triggs et al., 2007). However, despite there being no updated rural specific obesity prevalence figure in NZ, it is likely that the obesity rate has increased. As shown in more recent reports, many rural areas in NZ are classified as high-deprivation (2018) (Environmental Health Indicators New Zealand, 2018) and the 2020/2021 NZ health survey highlighted the overall adult obesity rate increased to 34.3 % from 31.2% in one year (Ministry of Health, 2022). With over 600,000 people living in rural NZ (Rural Health Alliance Aotearoa New Zealand, 2019), obesity is a health issue (World Health Organization, 2021a) which is putting significant time, resource, and financial strain on the NZ health system. Currently, one of the greatest impacts on rural health is obesity and its related physiological (type 2 diabetes, cardiovascular disease, and some cancers) and psychosocial (anxiety, depression, body dissatisfaction, social isolation, and poor self-esteem) complications (Ministry of Health, 2022; World Health Organization, 2021b). Rural areas notably experience more challenges with accessing primary healthcare than urban areas, with barriers such as rural geographical location, socioeconomic deprivation, transport, telecommunications, and price of healthcare all contributing to the risk of obesity development (Brewis, 2010).

Primary healthcare professionals, specifically nurses in general practice and nurses in Māori health provider clinics, are regarded as best suited to deliver weight management in NZ due to the frequency in which they see their patients over long periods of time (Ministry of Health, 2017). Similar to other countries protocols, including Australia, United Kingdom, Canada, and America (Moyer, 2012; National Health and Medical Research Council, 2013; National Institute for Health and Care Excellence (NICE), 2014; Obesity Canada, 2022), NZ nurses have support from the Clinical Guidelines for Weight Management (Ministry of Health, 2017) which outline best processes for delivery of obesity healthcare. This includes processes for monitoring, assessing, managing, and maintaining patient weight as well as advice for weight management strategies that can be referred to through general practice (Ministry of Health, 2017). Weight management strategies available in general practice include evidence based dietary advice, very low calorie diets, exercise programmes, commercial weight loss groups (such as Weight Watchers), meal replacements programmes, tele-health or mobile programmes, weight loss medication or bariatric surgery (Gudzune et al., 2015; Hebden et al., 2013; Ministry of Health, 2017; Te Morenga et al., 2018) which is similar to other high-income countries (Moyer, 2012; National Health and Medical Research Council, 2013; National Institute for Health and Care Excellence (NICE), 2014; Obesity Canada, 2022). General practice clinicians are tasked with delivering weight management healthcare, however, with the current healthcare clinician shortage not only in NZ (GP Pulse, 2022) but across the world (Royal College General Practitioners, 2021), nurses are taking on more of a role of supporting and managing patients. Rural general practice nurses are significantly impacted by the decline in GPs, where they

end up taking on extra duties to alleviate this gap (Doolan-Noble et al., 2019a), so much so that a rural nurse specialist role has been established (Bell et al., 2018) to alleviate some of this strain. Nurses have excellent skills in healthcare including health promotion, building strong therapeutic relationships with patients and their families, providing holistic healthcare, public health education, research for informing practice, and understanding their community health needs (Bell et al., 2018; McRobbie et al., 2008; Schwerdtle et al., 2020) who are a key general practice healthcare team member. However, obesity is a complex health issue with a myriad of contributing factors, including social determinants of health, psychological health, sociocultural norms, and political climates that shape individual lives (Brewis, 2010; British Psychological Society, 2019; World Health Organization, 2022). Identifying the appropriate weight management strategy that suits a patient is a complicated task for a nurse as one weight management tactic 'does not fit all'.

Overall, recent literature has indicated that an effective weight management strategy in primary care includes a combination of dietary control, exercise engagement, and behavioural changes actioned in culturally appropriate ways (Norman et al., 2021) however there are barriers to achieving this. Previous literature has indicated that nurses feel under-equipped to tackle weight management (Croghan et al., 2019), have a perceived lack of expertise in motivating patients, lack of access to culturally appropriate resources (Nolan et al., 2012), barriers around discussing obesity (Phillips et al., 2014), lack of time or access to a dietitian (Abbott et al., 2021) and lack of clarity around the nurse role or nurse protocol within their practice (Bell et al., 2018; Nolan et al., 2012; Van Dillen & Hiddink, 2014). Yet, these studies were not solely focused on the rural nurse perspective. One Wales based study, that included urban and rural nurses, found that barriers included not wanting to offend their patients, a range of professional perspectives about how to discuss weight management, and a lack of clear effective messages for positive health changes (Phillips et al., 2014). In NZ, barriers to weight management in general practice have been explored from GP (Claridge et al., 2014; Gray et al., 2018; Norman et al., 2022), pharmacist (Gray et al., 2016), and patient perspectives (Doolan-Noble et al., 2019b; Norman et al., 2023; Norman et al., 2022; Russell & Carryer, 2013) with only some of these solely focused on rural experiences. In addition, weight management strategies conducted with a Māori or Pacific cultural worldview outside the general practice context have also identified barriers (Bell et al., 2001; Eggleton et al., 2018; Forrest et al., 2016). Rural communities experience many healthcare inequities, including weight management intervention access (National Health Committee, 2010; Norman et al., 2022; Rural Health Alliance Aotearoa New Zealand, 2019). However, whilst some of these studies (both western centric and indigenous) include small numbers of rural participants, none of these studies focus on the rural nurse perspective of weight management despite having a significant role in this healthcare delivery. Overall, there is limited understanding of weight management in rural general practice from the nurse perspective worldwide, in NZ, and even less in the Waikato region which has a large rural and Māori population (Ministry of Health, 2021b). Obesity and its related comorbidities are putting significant strain on the health system, overloading the workload for an already short staffed workforce (GP Pulse, 2022; Ministry of Health, 2013, 2022; Thomas, 2023) and warrants attention.

Methods

Aims

The aim of this study was to explore the rural nurse practitioner experience with barriers to delivering weight management healthcare in their practice with a view to identifying areas of healthcare improvement.

Design

A case study design was used for this study, focussing on understanding the perspectives of a group of nurses who each worked in rural general practices. Increasingly, qualitative research is being sought and drawn on by policy makers and health professionals as the power of 'story' can resonate with, disrupt, or generate deeper understanding about existing knowledge. Qualitative research is useful in understanding the context of the lives that people are endeavouring to live with particular conditions. The nurses' narrative will resonate with others as they point to the front line experiences of people trying to do their best work in trying circumstances. The qualitative stories permit an understanding of the challenges but also of the care and skill with which nurses approach their work in obesity management care. As with many qualitative designs, semi structured interviews were used to elicit the perspectives of participants and as signalled, below, content analysis was deployed to draw out themes from the nurses' narratives (Braun & Clarke, 2006).

Participants

Practice nurses were recruited through rural general practices throughout the Waikato region. Rural general practices and Māori health providers in rural Waikato were contacted via email with an information sheet and consent form and invited to circulate the invitation to participate to their nurses and contact the researcher (KN) if they would like to take part. Māori health providers were included specifically to ensure indigenous health worldview perspectives of nurses were enabled to be collected and generate comprehensive findings. Inclusion criteria was a registered and currently practicing nurse practitioner from a rural general practice or a rural Māori health provider who delivered weight management in their role. There was no age, gender, ethnicity, or years in their role exclusion criteria. Rural locality was defined as per the Geographical Classification for Health (Whitehead et al., 2021). Once initial contact was made, any questions or concerns responded to, and the participant had agreed to participate, a suitable interview time and location was arranged at the convenience of the participant. Ten rural nurses volunteered to take part in this study from various rural localities. All were female and ranged from three to over twenty years experience as a practicing nurse.

Data collection

Semi-structured, open-ended interviews were held between May – October 2021. The researcher (KN) travelled to the participants to avoid potential rural location barriers for participating (Davis-Wheaton, 2013) and face-to-face interviews were conducted in sites including rural general practices, local cafés, and zoom interviews were held to align with relevant covid-19 lockdown restrictions. All appropriate cultural considerations were accommodated for, including time and space for prayer, karakia (Māori prayer), introductions, or other appropriate meeting opening/closing. All participants were reminded of their rights, the anonymous and confidential nature of the research, and any further questions or concerns were answered by the researcher before informed consent was granted. Once written consent forms were signed and verbal permission to audio record was granted, the interview commenced, and participants were given a \$30 voucher as recognition of their time. Participants were reminded they may pause, cease completely, and withdraw from participating at any stage with no questions asked.

Semi-structured interview questions were used to elicit understanding of the nurses' perspectives. Open-ended questions and the use of an interview guide (developed by whole research team) enabled a broad range of material to be discussed and assisted in assuring participants felt able to lead conversations in directions that mattered to them. Questions included: 'please tell me about your experience with delivering weight management healthcare in your practice?', 'could you please tell me about any barriers you have experienced with obesity healthcare in your practice?', and 'from your perspective, how effective do you find weight management strategies in your role and general practice?'. Interviews lasted up to 60 minutes, participants were thanked for their time, offered to review transcripts (none did) and the interview was closed. No follow up interviews were conducted and no participants withdrew from the study.

Ethical considerations

Ethical approval was granted by the University's Human Research Ethics Committee.

Data analysis

Interviews were audio recorded and transcribed verbatim. A deductive approach to analysis of the qualitative material was used, whereby the coding and theme development were framed within the existing concept of 'barriers' (Braun & Clarke, 2006). Transcripts were printed out, read, and re-read by two researchers (KN and LB). In the left-hand margin, passages of text were highlighted representing any barriers expressed in the interview and labelled with a code. In the right-hand margin, passages of text that were significant to weight management experiences were highlighted and labelled with a code as well, to enable any novel aspects to weight management to be identified from the participant narratives. All codes were listed out, with any double ups, redundant or irrelevant codes removed. Three participants' (from different rural localities) code lists were synthesised to form initial (seven) themes in collaboration with the wider research team (KN, LB, LC, HM and RL). The research team varied in experience to minimise bias, gain deeper insight, and generate comprehensive findings. This team consisted of emerging, middle and tenured academic researchers, clinical professionals (rural GP and nurse) and one member with lived experience with obesity and weight loss). All transcripts were revisited to check that these themes were evident in the data by two researchers (KN and LB). COREQ checklist was used for this study. While the ability to achieve data saturation is considered to be situated and subjective (Braun & Clarke, 2021) this analysis continued until the two researchers (KN and LB) agreed that no fresh themes were identifiable in the data. From this, a total of three overarching themes were identified: the limited scope of a nurse, patient level barriers, and cultural barriers.

Results

Limitations of a Nurse Role

Most nurses regarded comprehensive weight management as something that lay outside of the scope of their role. Most agreed that the effectivity of any weight management strategies depended on the peculiarities of individual patients' circumstances and experiences. Many nurses found themselves fulfilling roles such as a health coach, educator, wellbeing advisor, counsellor, facilitator for access to other social services, patient social support, or a motivational healthcare professional, depending on their patients' individual needs. One nurse described an encounter with a patient that clearly points to the complex nexus of factors present in any delivery of obesity health care.

Psychological factors, historical trauma, patterns of eating behaviour and nutritional advice all came into play in the following exchange:

“So, we talk about the psychology of- and why they're perhaps overweight. Talk about the upbringing, how the childhood perhaps had an impact on the weight. Often, they're-often people with depression, and other mental health problems. We usually go through, get a pen and paper and we write down what they ate on a daily basis. Generally, we talk about how often they have takeaways, and the impact of that, and the impact of obesity on the health and the future, what the future is going to be like being obese, as they grow older. Yeah that's probably the gist of it. We sort out a meal plan. We talk about how different foods and paint on the body, carbohydrates and sugars and fat” (Nurse 03)

As several of the nurses pointed out, they are not necessarily trained to address obesity management in these kinds of ways, nor is there time in a regular nurse/patient appointment to engage in these kinds of 'counselling' practices. As one nurse put it:

“It seems like the more effective programs I've seen lately are- use more counselling as to why you're eating that way or motivational therapy, and we just don't have the training or the time to do that at the moment” (Nurse 01)

Several acknowledged that discussing obesity with clients is delicate and challenging at the best of times, but even more so within the short time frame allocated for appointments. As one nurse put it, *“... you won't even touch on weight until you've got a therapeutic relationship that we can even talk about it!” (Nurse 02).*

Furthermore, given the multi-faceted nature of obesity, many nurses were highly attuned to the need for a holistic approach to address the range of factors involved. The constraints of the current model of care they operated in were often acknowledged as barriers to approaching health improvement in this holistic fashion. In other words, the systems they worked within were not necessarily set up to deal with the complexities of individual needs/experiences. As one nurse put it:

“So, yes, definitely, you have to have a well suited model of care in the practice that encompasses a holistic health journey for people, otherwise, obesity [management] will never happen. Sometimes obesity is the last thing they're worried about, they're worried about the thing that is happening right now. The cold, the flu, the broken arm from rugby practice. And the obesity is the elephant in the room because it's not talked about. They don't want to talk about it. Because our general practice model is set up for 15 minute consults- there is no time” (Nurse 02)

Many nurses stressed that often patients had other health concerns (physical or psychosocial) that were more important for them than weight specifically. This indicated the intricate nature of obesity and how the role of a nurse is applied to real-world contexts beyond the clinical or nutritional weight management needs. In many cases, weight loss was positioned as a by-product of adopting a healthier lifestyle which enabled overall health improvements for patients. As stressed by one nurse, simply telling someone to lose weight was not an effective strategy to achieving patient health improvement, and instead utilising a patient-centred approach aligned with their (perhaps non-clinical orientated) goals was more effective:

“[I’d say] but what are their goals? Your [practitioner] goals are to lower blood sugar, it might not be theirs. Their goal might be to live to see their grandchild. Their goal might be to walk to the letter box without having to stop. Until they can reach their goal, any goals you have as health professionals- we actually [have to be] really careful we don’t project our own on them. Whilst they might be genuine and good for society. I’m sorry if it’s not their goals then it’s not gonna happen. They might not know that within seven days of walking to the letter box it might be really surprising that they lose weight. It’s important that we are making sure that we’re going and striving for change with them” (Nurse 02)

More training, or referral pathways were reportedly needed for effective weight management healthcare given the minimal time available in primary care. Nurses expressed a desire to provide help to their patients in ways that suited them, yet they were limited in what they could offer patients. As detailed by one nurse:

“More training around different strategies would be great, or programs around- and even the counselling side of it, being more able to give strategies, I know, some mindfulness stuff which... I know that’s been proven to be helpful for a lot of people, but just kind of more strategies. Other than [shake diet] and go with more education, and then more programs that are easier for us to just sign our patients up to, because it’s hard for us to find the time” (Nurse 01)

Nurses reported that delivering weight management in their practice was complex and required many different skills to be effective and tailored for each patient. They identified education, scope of practice, time and system limitations in their current roles.

Patient Barriers

Nurses largely understood that there were numerous patient-level barriers to effective weight management healthcare delivery, including an obesogenic environment, the presence of social determinants of health, psychosocial issues and life stressors. Many nurses indicated that before even addressing nutritional components of weight management, other factors required urgent attention in the short time frame available. As one nurse described:

“Like I say it’s addressing the underlying issues. If they are stressed out with their finances, they are not going to be in the right head space to want to go be thinking ‘I need to exercise or eat healthy’. You’ve got to address the underlying issues [like] depression or family violence- whatever. You’ve got to do the wrap around to get your outcome. It’s no use just addressing one thing and just putting your finger in a hole- it’s going to blow somewhere else. For sure doing a proper assessment [is important but] then that comes down to time. You’ve got 10 minute appointments, often triple booked. And if you’ve got the time to spend with them to get to know them, engagement there, then you can often link in with other services” (Nurse 09)

Most of the nurses found that patient level factors were challenging to address as nurses. Often, referral to financial or social services was needed as many rural patients were living in high deprivation communities with unhealthy food environments where ‘healthy eating’ was considered

to be out of financial reach. One nurse highlighted how important it is to understand the patient level factors impacting their health to be able to offer relevant advice:

“You need to get into their mindset of where they’re at in life, what they’re doing, what they can afford, what they can’t afford” (Nurse 04)

Referral to other tailored health services were also reported to be out of financial reach for many of their patients in need:

“Then it’s expensive if you refer someone to anything- so a dietician is expensive, personal trainers are really expensive. Like, all of those things are expensive, and people just don’t have access to them” (Nurse 10)

Instead, nurses offered ‘practical advice’ for patients to improve health outcomes in ways that were regarded as feasible. This included strategies such as removing all high-sugar soda drinks from the home and swapping it for water, or avoiding snacking on high fat, high salt, high sugar or foods. As one nurse expressed:

“Cutting down from dark blue milk to light blue, getting rid of your cream... Or if you’re getting takeouts, don’t go to a KFC, there are better options. So [we] don’t say ‘do not eat’, you ‘should not’ have. [Instead] offer them options that you know are going to work” (Nurse 09)

Or alternative exercise options that are feasible, as described by one nurse:

“You don’t have to go to a gym, just walk. Walk for an hour a day if you can, play with your kids more, rather than sitting on the couch” (Nurse 09)

Most of the nurses stressed a need to ensure any advice given in their practice took into consideration the unique patient level factors that can be hindering weight management efforts. Offering practical food and exercise advice was identified to be best practice in their role for patient wellbeing.

Cultural Barriers

Many nurses identified that the available weight management options in primary care were not necessarily realistic, nor accessible, for their rural or indigenous patients. Poverty, lack of access to public transport or private car and mobility issues were just a few of the barriers to engagement with programmes. As one nurse described:

“You know, knee problems, hip problems, problems with obesity are huge. So if you want to say, look, we need to look at low impact exercise, like swimming or cycling, one they don’t have access to a pool. And if they do, they have to travel and you know, it’s not always optional” (Nurse 09)

To counteract this inaccessibility, nurses attempted to provide practical and feasible options for exercise. As expressed by one nurse:

“Trying to show them basic exercises that they can do at home [helps] if they don’t want to go walk the streets, they could walk around their house X amount of times, if they’ve got stairs they can go up and down steps” (Nurse 04)

Many nurses highlighted that the available weight management strategies were not tailored for the wide range of cultures that make up NZ unique population which acted as a barrier in their practice. One nurse highlighted the intersection of barriers that existed for some patients, whereby financial affordability, access to transport, cultural food practices and rural lifestyle limitations rendered offering and following recommended nutritional guidelines difficult:

“They can’t afford it! Yeah when I worked for [health practice] they wanted me to do a kete, like the [food] pyramid and I was in [inland town] and they wanted me to go and get fresh fish, and kina, and I’m thinking- where the hell am I going to get that? Yes we are Māori- but it’s only if someone is going up the coast that’s got a boat- which no one’s really gotta boat- and what about the rural people that are stuck way out? They are not gonna go and think I’ll have salmon and salad for dinner” (Nurse 05)

Some nurses stressed that while there were some resources available about best practice nutritional guidelines, these were not always relevant to their rural patients’ lifestyles. Instead, nurses attempted to offer culturally relevant advice, however this was expressed with a sense of lack of confidence as there was no standardised nutritional information to offer in their practice. As one nurse indicated:

“We have a lot of Samoans and Indians, so you can tailor it a little bit, you know, what rice do you use? What oil do you use? I don’t have a huge knowledge of other diets or other ethnicities, but it’s a starting point” (Nurse 09)

Overall, nurses reported to have many facets to their role with weight management, which was difficult to deliver due to patient level barriers, rural or cultural lifestyles, and lack of access to programmes that are relevant or feasible for patients in their rural practice.

Discussion

Analysis across the three themes discussed above would suggest that nurses' role in weight management is a multi-layered and complex affair. Patient- level factors (such as social determinants of health) necessarily became part of a nurse's role when delivering weight management care. Nurses found themselves facilitating access to social services, behaving like a counsellor, health coach, and operating as pedagogues, tailoring 'education' to different patients' needs. Their role was a 'holistic' one, yet current models of care were not necessarily set up to permit this holistic approach. In many cases, before even offering a nutritional plan for physiological weight loss, nurses needed to address other aspects of their patients' health needs, such as ensuring a safe environment, firming up financial status, and assessing psychological or sociocultural situations.

The role described above is a multifaceted one, yet significant time, resource, and support restrictions constrained nurses’ capacity to deliver quality obesity health care in the ways they

would have liked to. Nurses are not formally trained to be counsellors, motivational therapists, dietitians, educators, or behavioural change psychologists, yet they needed to be one or all of these things to support and empower their patients. Many nurses called for more time in their role to up-skill their training and education in the weight management field. They wanted to enhance their capacity to meet the diverse patient needs in this area.

Effective obesity healthcare has been identified to utilise a multi-disciplinary approach (Anderson et al., 2021; Bischoff et al., 2017), including qualified pharmacist prescribers, dietitians, psychologists, social care workers each of whom have years of training and development around the intricacies of weight management. However, these teams are rarely present or accessible on a consistent basis for rural general practices in NZ, which is potentially perpetuating the heavy and expanded workload that falls into nurses' laps. While this study offers support for previous literature that indicated the role of a rural practice nurse in weight management is undefined, with different views of a nurses' professional responsibilities and boundaries (Bell et al., 2018; Doolan-Noble et al., 2019a), this study sheds light on the extent and range of extra responsibilities rural nurses take on in a real-world context. It was encouraging to find that rural nurses go above and beyond their job description. However, given the already reported time, funding, staffing, training, and resource constraints rural health experiences (Alsop-ten Hove, 2019; Davis-Wheaton, 2013; National Health Committee, 2010), it may be unreasonable to expect rural nurses to provide services they are not specialists in for such a complex and unique health issue. Instead of further overloading the already strained role of a nurse (Bennett et al., 2012; Doolan-Noble et al., 2019a), this study recommends that rural nurses be systemically supported with access to a wider multi-disciplinary team, ideally based in general practice, to offer the range of weight management services that rural communities reportedly could benefit from.

Rural locality was positioned as a barrier hindering many weight management efforts. Nurses stressed that many of the options available through general practice (or outlined in the CWMG) (Ministry of Health, 2017) were predominantly 'impractical' or 'unsuitable' for their rural patients who were living in high deprivation areas with no financial means or transport to attend programmes or exercise facilities located out of town. While it is recommended that any weight management healthcare be delivered in culturally appropriate ways (CWMG), these nurses indicated a lack of resources or access to information that is specific to the range of cultural food norms practiced in NZ, including those of Māori. While these findings align with previous rural patient (Norman et al., 2022; 2023) and GP perspective literature that highlight the complexities for effective weight management in rural settings (Norman et al., 2022) this study extends this to the often overlooked rural nurse experience. Nurses offered patients 'practical' or 'realistic' obesity related health advice (such as changing to low fat milk, removing high-sugar drinks out of the house, and home exercises) - advice that they felt patients could conceivably achieve. While not explicitly labelled as such by the participants, this 'practical' advice and behaviour in their practice would indicate that these nurses' care aligned with the ethos of contemporary movements such as 'Health at any Size' (Bacon, 2010; Bacon & Aphramor, 2011). Focussing less on a (notably flawed) BMI scale (Bhurosy & Jeewon, 2013) or weight number and more on health related improvements (such as lowering risk of stroke, heart disease, or diabetes through small changes to diet and exercise in sustainable formats) was stressed as 'best practice' for these rural nurses given the limited 'suitable' weight management referral options to offer patients. It is commendable that rural nurses are providing beneficial healthcare in areas experiencing significant accessibility issues (National Health Committee, 2010) by tailoring health advice to meet the sociocultural norms and socioeconomic limitations of communities (Coupe et al., 2018; Verbiest et al., 2018). However, it also sheds light on

the difficulties experienced and near impossibility for rural nurses to meet their rural patients' complex weight management needs, as there are many social determinants of health and environmental factors affecting their rural patients (Swinburn, 1999; World Health Organization, 2022) that are outside the scope of a nurse or general practice control.

Implications and Future Directions

This study sheds light on an important member of rural health team, the nurse, which has been given little attention, despite having a significant role in weight management healthcare in general practice. Overall, this study highlighted a myriad of extra responsibilities a rural nurse actions within a more restrictive health access climate when compared to their urban counterparts and warrants further attention. Further investigation into how to better support rural nurses working in the weight management general practice context in high deprivation communities is recommended. NZ is currently undergoing significant health reforms, with rural health being recognised as a unique and stand-alone health sector moving forward due to the different health needs than urban (New Zealand Government, 2022; Rural Health Alliance Aotearoa New Zealand, 2019). In addition, clinician burnout from heavy workloads and significant staff shortages across NZ are adding to the already reported largely autonomous, complex, and heavy workload of a rural nurse (Doolan-Noble et al., 2019a; Goodyear-Smith & Janes, 2008). Difficulties in retention and professional development for rural nurses have been indicated in previous NZ literature (Carruyer et al., 2011; Doolan-Noble et al., 2019a). Further to this, recent studies have indicated the gap in systemic support for rural health in areas other than obesity, including the covid-19 prevention and vaccination priority (Whitehead et al., 2022). This lack of systemic support for rural healthcare and rural nurses working in weight management would benefit from being addressed if the current rural health workforce is to grow and be maintained long-term. Rural general practice, and especially the multi-faceted rural nurse role, should be prioritised for funding, patient referral access to multi-disciplinary teams, 'practical' rural weight management intervention options, and staff training to reduce the strain on the rural nurse, improve working conditions for rural nurses, and assist with providing quality health care to improve rural patient health outcomes.

Future directions should look to explore the key barriers this study found to identify areas for improvement of weight management healthcare services rurally. This includes exploring the social determinants of health impacting on rural communities, investigating the lack of 'practical' culturally appropriate or tailored weight management resources in rural general practices, and a lack of rurally appropriate weight management referral options. Cultural norms play a significant role in dietary consumption and have been identified as a contributing factor to obesity (Ball, 2010) which can also extend into the rural cultural lifestyle. In addition, grounding practice in indigenous health models has been demonstrated to improve health outcomes for indigenous populations and should be focussed on for Māori (Campbell et al., 2017; Eggleton et al., 2018; Forrest et al., 2016; Ministry of Health, 2015). However, potentially, the intersectionality of obesity, culturally specific worldviews, and social determinants of health should be further investigated to include a rural/urban intersection as well as rural health needs are recognised to be different to urban.

Limitations

As with any qualitative study, the findings can not be generalised. However, this study aimed to explore the perspectives of rural Waikato nurses, who are already a

small homogenous sample to elicit data from and are transferable to other rural general practices across NZ. Due to covid-19 restrictions only ten nurses were able to participate. Including more participants with a wider ethnicity, age and male nurse perspectives could generate more nuances across the narratives. However, data saturation was considered to be reached with no new themes emerging from nurse narratives. Whilst this research did include Māori voices, was guided by a cultural advisor, and utilised two data researchers with a reflexive approach, a Kaupapa Māori methodology could elicit richer Māori data and findings relevant to the Māori population.

Conclusion

This study found that nurses experience barriers to delivering effective weight management in their practice due to factors outside the scope of their practice such as patient level factors, social determinants of health, rural locality restrictions and limitations to their role. Nurses were found to go above and beyond their role description to accommodate for the myriad of weight related needs for their patients, however, they experience a lack of systemic support in the form of time, resources, funding, and effective weight management referral options. Future investigation should look to address the unique rural weight management healthcare needs that experience many barriers. Nurses provide an invaluable contribution to the primary care team, however more support for rural nurses is required to deliver effective healthcare to rural communities and reduce the workload strain on the rural nurse workforce.

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Conflicts of Interest

None

Ethical Standards

The authors assert that all procedures contributing to this work comply with the ethical standards of the relevant national and institutional guidelines on human experimentation (University of Waikato Human Ethics Committee) and with the Helsinki Declaration of 1975, as revised in 2008. Written informed consent was obtained from all participants.

Competing interests

The author(s) declare none

References

- Abbott, S, Parretti, H, and Greenfield, S. 2021: Experiences and perceptions of dietitians for obesity management: a general practice qualitative study. *Journal of Human Nutrition and Dietetics*, 34, 494-503.
- Alsop-ten Hove, B. 2019: Tackling rural health inequities from the ground up. *New Zealand Medical Student Journal*, 29-31.
- Anderson, Y, C, Wild, C, E, K, Hofman, P, L, Cave, T, L, Taiapa, K, J, Domett, T, . . . Willing, E, J. 2021. Participants' and caregivers' experiences of a multidisciplinary programme for healthy lifestyle change in Aotearoa/New Zealand: a qualitative, focus group study. *BMJ Open*, 11(5), e043516. <https://doi.org/10.1136/bmjopen-2020-043516>
- Bacon, L. 2010. *Health at every size: The surprising truth about your weight*. BenBella Books, Inc.
- Bacon, L, and Aphramor, L. 2011. Weight science: evaluating the evidence for a paradigm shift. *Nutrition Journal*, 10(1), 9.
- Ball, K, Crawford, D, Jeffery, R, and Brug, J. 2010: The role of socio-cultural factors in the obesity epidemic. *Obesity Epidemiology: from Aetiology to Public Health*, 2, 105-118.
- Bell, Crawford, R, and Holloway, K. 2018: Core components of the rural nurse specialist role in New Zealand. *Rural and Remote Health*, 18.
- Bell, A, Swinburn, B, Amosa, H, and Scragg, R. 2001: A nutrition and exercise intervention program for controlling weight in Samoan communities in New Zealand. *International Journal of Obesity*, 25, 920-927.
- Bennett, P, Barlow, V, Brown, J and Jones, D. 2012: What do graduate registered nurses want from jobs in rural/remote Australian communities? *Journal of Nursing Management*, 20, 485-490.
- Bhurosy, T, and Jeewon, R. 2013. Pitfalls of using body mass index (BMI) in assessment of obesity risk. *Current Research in Nutrition and Food Science Journal*, 1(1), 71-76.

- Bischoff, S, C, Boirie, Y, Cederholm, T, Chourdakis, M, Cuerda, C, Delzenne, N, M, . . .
Barazzoni, R. 2017. Towards a multidisciplinary approach to understand and manage obesity and related diseases. *Clinical Nutrition*, 36(4), 917-938.
- Braun, V and Clarke, V. 2006: Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3, 77-101.
- Braun, V and Clarke, V. 2021: To saturate or not to saturate? Questioning data saturation as a useful concept for thematic analysis and sample-size rationales. *Qualitative Research in Sport, Exercise and Health*, 13, 201-216.
- Brewis, A, A. 2010. *Obesity: Cultural and biocultural perspectives*. Rutgers University Press.
- British Psychological Society. 2019. *Psychological perspectives on obesity: Addressing policy, practice and research priorities*. Retrieved March 2022 from <https://www.bps.org.uk/news-and-policy/psychological-perspectives-obesity-addressing-policy-practice-and-research>
- Campbell, M, Hunt, J, Scrimgeour, D, Davey, M, and Jones, V. 2017: Contribution of Aboriginal Community-Controlled Health Services to improving Aboriginal health: an evidence review. *Australian Health Review*, 42, 218-226.
- Carryer, J, Boddy, J, and Budge, C. 2011: Rural nurse to nurse practitioner: an ad hoc process. *Journal of Primary Health Care*, 3, 23-28.
- Claridge, R, Gray, L, Stubbe, M, Macdonald, L, Tester, R, and Dowell, A. 2014: General practitioner opinion of weight management interventions in New Zealand. *Journal of Primary Health Care*, 6, 212-220.
- Coupe, N, Cotterill, S and Peters, S. 2018: Tailoring lifestyle interventions to low socio-economic populations: a qualitative study. *BMC Public Health*, 18, 1-15.
- Croghan, I, Ebbert, J, Njeru, J, Rajjo, T, Lynch, B, Dejesus, R, Jensen, M, Fischer, K, Phelan, S and Kaufman, T. 2019: Identifying opportunities for advancing weight management in primary care. *Journal of Primary Care and Community Health*, 10, 2150132719870879.

- Davis- Wheaton, J. 2013: Breaking down health barriers in rural areas. *Kai Tiaki: Nursing New Zealand*, 19, 2.
- Doolan-Noble, Ross, J, Johnson, R, Birks, M, Francis, K and Mills, J. 2019a: Rural nursing in Aotearoa New Zealand and Australia: embracing strategic foresight to sustain tomorrow's workforce. *Scope Contemporary Research Topics Health Wellbeing*, 4, 58-62.
- Doolan- Noble, F, Pullon, S, Dowell, T, Fuller, D, and Love, T. 2019b: Men living with obesity in New Zealand: What does this mean for health care in general practice? *Obesity Research and Clinical Practice*, 13, 233-239.
- Eggleton, K, Stewart, L and Kask, A. 2018: Ngātiwai Whakapakari Tinana: strengthening bodies through a Kaupapa Māori fitness and exercise programme. *Journal of Primary Health Care*, 10, 25-30.
- Environmental Health Indicators New Zealand. (2018). *Socioeconomic deprivation profile*. Retrieved March 2023 from [https://ehinz.ac.nz/indicators/population-vulnerability/socioeconomic-deprivation-profile/#:~:text=New%20Zealand%20Index%20of%20Deprivation%20\(NZDep\),-The%20NZDep%20is&text=It%20measures%20the%20level%20of,small%20areas%20in%20New%20Zealand](https://ehinz.ac.nz/indicators/population-vulnerability/socioeconomic-deprivation-profile/#:~:text=New%20Zealand%20Index%20of%20Deprivation%20(NZDep),-The%20NZDep%20is&text=It%20measures%20the%20level%20of,small%20areas%20in%20New%20Zealand).
- Forrest, R, Taylor, L, Roberts, J, Pearson, M, Foxall, D, and Scott-Chapman, S. 2016: Patu™: Fighting fit, fighting fat! The Hinu Wero approach. *AlterNative: An International Journal of Indigenous Peoples*, 12, 282-297.
- Goodyear-Smith, F, and Janes, R. 2008. New Zealand rural primary health care workforce in 2005: more than just a doctor shortage. *Australian Journal of Rural Health*, 16(1), 40-46.
- GP Pulse. 2022. *GP Future Workforce Requirements Report highlights*. GP Pulse, New Zealand. Retrieved March 2022 from https://www.rnzcgp.org.nz/GPPulse/GPPulse/College_news/2022/GP_Future_Workforce_Requirements_Report_highlights_shortages.aspx

- Gray, L, Chamberlain, R, and Morris, N. 2016: “Basically you wait for an ‘in’”: community pharmacist views on their role in weight management in New Zealand. *Journal of Primary Health Care*, 8, 365-371
- Gray, L, Stubbe, M, Macdonald, L, Tester, R, Hilder, J and Dowell, A. 2018: A taboo topic? How General Practitioners talk about overweight and obesity in New Zealand. *Journal of Primary Health Care*, 10, 150-158.
- Gudzune, K, A, Doshi, R, S, Mehta, A, K, Chaudhry, Z, W, Jacobs, D, K, Vakil, R, M, . . . Clark, J, M. 2015. Efficacy of commercial weight-loss programs: an updated systematic review. *Annals of Internal Medicine*, 162(7), 501-512.
- Hebden, L, Balestracci, K, McGeechan, K, Denney-Wilson, E, Harris, M, Bauman, A, and Allman-Farinelli, M. 2013. 'TXT2BFIT' a mobile phone-based healthy lifestyle program for preventing unhealthy weight gain in young adults: study protocol for a randomized controlled trial. *Trials*, 14, 75.
- McRobbie, H, Bullen, C, Glover, M, Whittaker, R, Wallace-Bell, M, and Fraser, T. 2008: New Zealand smoking cessation guidelines. *The New Zealand Medical Journal (Online)*, 121.
- Ministry of Health. 2013. *Annual Report for the year ended 30 June 2013 including the Director-General of Health's Annual Report on the State of Public Health*. Wellington: Ministry of Health. Retrieved March 2022 from <https://www.health.govt.nz/publication/annual-report-year-ended-30-june-2013>
- Ministry of Health. 2015. *Māori health models*. Retrieved March 2022 from <https://www.health.govt.nz/our-work/populations/maori-health/maori-health-models>.
- Ministry of Health. 2017. *Clinical Guidelines for Weight Management in New Zealand Adults*. Retrieved March 2022 from <https://www.health.govt.nz/publication/clinical-guidelines-weight-management-new-zealand-adults>
- Ministry of Health. 2021. *Obesity Statistics*. Retrieved March 2022 from <https://www.health.govt.nz/nz-health-statistics/health-statistics-and-data-sets/obesity-statistics>.

- Ministry of Health. (2021b). *Population of Waikato DHB*. Retrieved March 2022 from <https://www.health.govt.nz/new-zealand-health-system/my-dhb/waikato-dhb/population-waikato-dhb>
- Ministry of Health. 2022. *Obesity*. Retrieved February 2022 from <https://www.health.govt.nz/our-work/diseases-and-conditions/obesity>
- Moyer, V. 2012: Screening for and management of obesity in adults: US Preventive Services Task Force recommendation statement. *Annals of Internal Medicine*, 157, 373-378.
- National Health and Medical Research Council. (2013). *Clinical Practice Guidelines for the management of overweight and obesity in adults, adolescents and children in Australia*. Retrieved march 2022 from <https://www.nhmrc.gov.au/about-us/publications/clinical-practice-guidelines-management-overweight-and-obesity>
- National Health Committee. 2010: *Rural Health Challenges of Distance Opportunities for Innovation*. Retrieved April 2022 from <http://www.nhc.health.govt.nz>
- National Institute for Health and Care Excellence (NICE). 2014: *Weight management: lifestyle services for overweight or obese adults. Public Health Guideline [PH53]*. NICE. Retrieved June 2022 from <https://www.nice.org.uk/guidance/ph53>
- NCD Risk Factor Collaboration. 2019: Rising rural body-mass index is the main driver of the global obesity epidemic in adults. *Nature*, 569, 260.
- New Zealand Government. 2022. *Pae Ora (Healthy Futures) Bill*. Retrieved March 2022 from <https://legislation.govt.nz/bill/government/2021/0085/latest/LMS575405.html>
- Nolan, C, Deehan, A, Wylie, A, and Jones, R. 2012. Practice nurses and obesity: professional and practice-based factors affecting role adequacy and role legitimacy. *Primary health care research & development*, 13(4), 353-363.
- Norman, K, Burrows, L, Chepulis, L, Keenan, R, and Lawrenson, R. 2023. Understanding weight management experiences from patient perspectives: qualitative exploration in general practice. *BMC Primary Care*, 24(1), 45.
- Norman, K, Burrows, L, Chepulis, L, and Lawrenson, R. 2022. "Sometimes choices are not made, because we have 'a' choice, they're made because they are 'the' choice":

- Barriers to weight management for clients in rural general practice. *BMC Primary Care*, 23(1), 268.
- Norman, K, Chepulis, L, Burrows, L, and Lawrenson, R. 2021. Adult obesity management in New Zealand general practice: a review. *Journal of Primary Health Care*.
- Norman, K, Chepulis, L, Campbell, F, Burrows, L, and Lawrenson, R. 2022. Waikato GP perspectives on obesity management in general practice: a short report. *Journal of Primary Health Care*.
- Obesity Canada. 2022. *Canadian Adult Obesity Clinical Practice Guidelines*. Obesity Canada. Retrieved 5 June from <https://obesitycanada.ca/guidelines/chapters/>
- Organisation for Economic Co-operation and Development (OECD). 2017. *OECD Obesity Update 2017*. OECD: Paris, France. Retrieved 24 January from <https://www.oecd.org/health/obesity-update.htm>
- Phillips, K, Wood, F and Kinnersley, P. 2014: Tackling obesity: The challenge of obesity management for practice nurses in primary care. *Family Practice*, 31, 51-59.
- Royal College General Practitioners. 2021: *Chronic shortage of GPs is the reason patients are facing long waiting times for appointments, says College* [Online]. England: Royal College of General Practitioners. Retrieved June 2022 from <https://www.rcgp.org.uk/about-us/news/2021/september/chronic-shortage-of-gps-is-the-reason-patients-are-facing-long-waiting-times-for-appointments.aspx>
- Rural Health Alliance Aotearoa New Zealand. 2019: *RHAANZ Rural Health Road Map*. Retrieved February 2022 from <https://rhaanz.org.nz/wp-content/uploads/2019/11/Rural-Health-Road-Map-2019.pdf>
- Russell, N and Carryer, J. 2013: Living large: the experiences of large-bodied women when accessing general practice services. *Journal of Primary Health Care*, 5, 199-205.
- Schwerdtle, P, Connell, C, Lee, S, Plummer, V, Russo, P, Endacott, R, and Kuhn, L. 2020: Nurse expertise: A critical resource in the COVID-19 pandemic response. *Annals of Global Health*, 86.

- Swinburn, B, Egger, G, and Raza, F. 1999: Dissecting obesogenic environments: the development and application of a framework for identifying and prioritizing environmental interventions for obesity. *Preventive Medicine*, 29, 563-570.
- Te Morenga, L, Pekepo, C, Corrigan, C, Matoe, L, Mules, R, Goodwin, D, . . . Ni Mhurchu, C. 2018. Co-designing an mHealth tool in the New Zealand Māori community with a “Kaupapa Māori” approach. *AlterNative: An International Journal of Indigenous Peoples*, 14(1), 90-99.
- Thomas, R. 2023. 'It's about people's lives': GP workforce survey shows more burnout than ever. *Stuff*. <https://www.stuff.co.nz/national/health/131646183/its-about-peoples-lives-gp-workforce-survey-shows-more-burnout-than-ever>
- Triggs, S, Mason, K, and Borman, B. 2007. *Urban-rural Health Comparisons: Key Results of the 2002/03 New Zealand Health Survey*. Ministry of Health.
- Van Dillen, S, M, and Hiddink, G, J. 2014. To what extent do primary care practice nurses act as case managers lifestyle counselling regarding weight management? A systematic review. *BMC Family Practice*, 15(1), 1-9.
- Verbiest, M, E, A, Corrigan, C, Dalhousie, S, Firestone, R, Funaki, T, Goodwin, D, . . . Mhurchu, C, N. 2018. Using codesign to develop a culturally tailored, behavior change mHealth intervention for indigenous and other priority communities: A case study in New Zealand. *Translational Behavioral Medicine*, 9(4), 720-736.
- Whitehead, J, Carr, P, Scott, N and Lawrenson, R. 2022: Structural disadvantage for priority populations: the spatial inequity of COVID-19 vaccination services in Aotearoa. *NZMA*, 135, 1175-8716.
- Whitehead, J, Davie, G, De Graff, B, Crengle, S, Fearnley, D, Smith, M, Lawrenson, R and Nixon, G. 2021: Defining Rural In Aotearoa New Zealand: A Novel Geographic Classification For Health Purposes.
- World Health Organization. 2021a. *Obesity*. Retrieved March 2022 from <https://www.who.int/topics/obesity/en/>

World Health Organization. 2021b. *Obesity and Overweight*. Retrieved March 2022 from <https://www.who.int/en/news-room/fact-sheets/detail/obesity-and-overweight>

World Health Organization. 2022: *Social Determinants of Health*. Retrieved October 2021 from https://www.who.int/health-topics/social-determinants-of-health#tab=tab_2

Chapter 8: Client Perspectives of Barriers

Study 3: Client In-depth Qualitative Interviews

Overview

As highlighted by the reviews in chapter 3 and 4, the survey in chapter 5, and the GP and nurse views in chapter's 6 and 7, obesity is a complicated health issue which can be experienced differently by all individuals. Therefore, it is important to explore the narratives and experiences of the clients in general practice to understand their views. This chapter sheds light on the barriers faced by those engaging with weight management in rural general practice in communities.

Title: “Sometimes choices are not made, because we have 'a' choice. They're made because they are 'the' choice”: Barriers to weight management for clients in rural general practice.

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No conflicts of interests.

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Abstract

Background: Obesity is an international health issue which currently affects over 34% of New Zealand adults and leads to further physical and psychosocial health complications. People living in rural communities experience health inequities and have a high-risk of becoming obese. The aim of this study was to explore and identify barriers to effective weight management in rural Waikato general practice. **Methods:** Using semi-structured interviews, 16 rural Waikato participants shared their experiences with barriers to weight management. Interviews were transcribed and analysed using thematic analysis. **Results:** Four themes were identified: economic barriers, rural locality barriers, rural sociocultural norms barriers, and participants' understanding the solutions needed to overcome their specific barriers to effective weight management. For these participants, finding a feasible weight management strategy was a challenging first step in their weight management journey. A programme that would 'work' meant one that was economically viable for low-income persons, accessible, even if living rurally with less resources, and did not cause harm or jeopardise their social connections within family or community. **Conclusion:** Overall, participants noted a lack of weight management strategy 'choice' because of income, isolation or accessibility of their rural location and/or the sociocultural norms of the community they lived in restricted options available to them. Future weight management initiatives may be better devised from within communities themselves and will need to be cognisant of the barriers specific to rural communities. Rural perspectives have much to offer in any such reconsideration of weight management initiatives.

Keywords: Obesity, Weight Management, Primary Care, Rural Health, Qualitative, Patient Perspective

Introduction

Obesity is identified as a significant health concern affecting over 650 million people worldwide (1) with 34% of New Zealand (NZ) adults classed as obese (2). Obesity is predominantly recognised as a risk factor for further health concerns by NZ's Ministry of Health (MOH) (1, 3) with rural areas reported to have a higher prevalence of obesity than their urban counterparts in NZ (4, 5). In NZ, the most at-risk populations are those living in socioeconomically deprived areas (1.6 times more likely to be obese), rural areas and those who identify as Indigenous Māori (51% obesity rate) or Pasifika (71%) (2, 5).

Contributors to obesity are recognised as more complex than an 'excess calorie' intake through food (6), with social determinants of health significantly influencing obesity development, especially for rural areas (7, 8). The obesogenic environments and political/ sociocultural systems in which people are born, live grow, work and age in can all influence obesity development (7, 9, 10). The cost of fresh 'healthy' whole foods is out of financial reach for many low-income families, with processed (commonly high in carbohydrate, fat and sugar) foods readily available and pervasively marketed to those in lower socioeconomic areas (9, 11-13). In addition, rural areas experience less employment opportunities leading to high deprivation, limited local food stores or exercise facilities (driving prices up for importing goods and minimizing competitive markets), and less (or no) access to private car or public transport to access the resources they need for good health and effective weight management (8, 14).

'Obesity' and 'weight management' are debatable concepts with clinical, sociocultural, and individual perspectives widely differing. Clinically, obesity is objectively measured and categorised using the arguably flawed Body Mass Index (BMI) tool (15, 16), and 'managed' using a calorie deficit dietary plan (17). However, research indicates that the clinician and client definitions of overweight and obese differ (18, 19), with some cultures viewing excess weight as a positive phenomenon, therefore not warranting 'management' (20, 21) highlighting the subjective nature of the 'obesity'. Further, some researchers question the obesity measurements and existence of a health issue (22-24) while some individuals exercise their autonomy and choose to be 'obese' (25, 26). Regardless of the debates, obesity is a stigmatised health concern in western contexts and for those who want to lose weight or control their weight, weight management is an effective intervention and prevention strategy for obesity and its related comorbidities (17).

While acknowledging the significant role modern obesogenic environments and an individual's choice to engage with weight management plays, one of the most effective ways to achieve weight management is through a combination of diet, exercise, and behavioural change conducted in culturally appropriate ways (17, 27). This combination and balance of factors needs to be calibrated to the individual for suitability as no one diet suits all individuals. Many national health systems including the UK, Australia, Canada, America and NZ position primary care and general practice as best suited to deliver obesity healthcare with their clients using clinical weight management guidelines (17, 28-31). However, weight management options are also available privately, through commercial avenues, or internet based information and sources for those who want to manage their weight themselves. Options within and outside the scope of general practice can include bariatric surgery, weight loss drugs/ medication, very low-calorie diets, meal replacement programmes, exercise programmes, commercial weight loss groups, telehealth or mobile app-based programs (17, 32-34). However, the obesity rates are reportedly still rising in NZ, indicating that current weight management strategies in general practice are not effective.

Through understanding what shapes rural experiences of weight management, valuable insights may be gained that can inform future obesity healthcare in the primary care space, enhance health outcomes, reduce obesity rates and increase quality of life. The aim of this study was to explore and identify barriers to effective weight management in rural Waikato general practice from the client perspective.

Method

Participants

Participant criteria was >25 years old, residing (or recently resided) in a rural Waikato geographical location and identified as someone with experience in weight management. While the individualised and subjective nature of obesity (18, 35, 36) is noted, for the purposes of this study all participants were currently, or have had, a BMI over >30 (clinically obese) (16). Rural has been a contested definition issue in NZ, however for the purposes of this health research, rural was defined as per the Geographical Classification of Health (37). Participants were recruited on a volunteer basis and purposeful sampling of males only was actioned towards the end as the sample was predominantly female (38). A total of 16 participants were recruited from multiple rural locations to ensure data was not relegated to one locality which might have unique barriers, with demographic information listed in Table 1 below.

Table 7: Participant Demographic Data

Demographic	Participants (n)
Male	3
Female	13
Māori / NZ European and Māori	8
Non-Māori	8
Age 25- 45 years	8
Age 46-70 years	8

Data collection

Firstly, rural Waikato general practices and Māori health providers were contacted via phone and email and invited to participate. The general practitioners (GPs), nurses, and Māori healthcare professionals were asked to identify any of their clients that fit the criterion of this study. Once identified, they were asked to pass the researcher's details to the client, or gain consent for their details to be passed to the researcher so they can be contacted. Secondly, snowballing strategy was utilised (38), whereby the researcher's professional University and District Health Board networks and participants were asked to advise anyone they knew who fit the criteria to contact the researcher (5 participants were recruited this way). Once initial contact was made, the participant was given a copy of the information sheet and consent form to read and sign. All participant questions or concerns were answered and a suitable interview time and location was organised. Locations were chosen by the participant and included the researcher's office, participant homes, cafes, local library, via skype, or their local general practice. A Māori cultural advisor was included throughout the research to ensure the Māori participant data was collected, analysed, and presented in a culturally appropriate manner and cultural safety was achieved (39).

Procedure

Interviews were semi-structured to ensure that, although guided by a set of questions, participants were able to take the conversation in directions they wanted to throughout. At the beginning of each interview, the objective of the study was re-stated, and participants reminded they can end the interview at any time. All participants were offered space and time prior to the interview for culturally appropriate opening of meetings, such as prayer or karakia (Māori prayer). All interviews were guided by an interview guide which included open-ended questions such as: 'could you please tell me about your experience with weight management?', 'could you please tell me about your experience with any barriers to weight related health engagements?', 'could you please tell me about your weight management experience living rurally?'. All participants were encouraged to speak about their experience for as long as they wanted to. Interviews lasted between 20 to 60 minutes and were audio recorded for later transcription. Participants were thanked for their participation and given a \$30 voucher as a compensation for their time.

Analysis

All interview data was transcribed verbatim for authenticity purposes and analysed using thematic analysis (40). Each transcript was printed out, read, and re-read by the researcher with a view to facilitating immersion in the data. In the left-hand margin of each transcript, sections of conversation that reflected a 'barrier' to weight management in general practice were highlighted as this was main aim of this study. In the right-hand margin ideas that were significant to the participants' discourse, including any obesity related barriers outside the general practice context were labelled permitting new or unexpected concepts to be identified and highlighted. These included the WHO defined (7) social determinants of health concepts (circumstances in which a person is born, lives and grows) such as poverty, housing, ethnicity, gender, and education. Each transcript was analysed in turn, and then comparatively re-analysed for any missing codes. All codes were listed, and redundant or double-up codes were removed. Whilst the ability to achieve data saturation is situated and subjective (41), this analysis found no new themes were being interpreted when revisiting the transcripts and reflecting on codes already identified (40). The remaining codes were then grouped into overarching themes. Four themes were identified: three barriers (Economic, Rural Locality and Social Norms) and one solution-based theme (Community Know their Needs).

Ethics Approval

Ethical approval was granted by the University of Waikato Human Research Ethics Committee reference HREC2020#38.

Results

Economic Barriers

Participants reported an awareness of effective health-enhancing weight management processes. Most participants shared an understanding that being a healthy weight involved eating healthy food (or less 'junk' food) and exercising more (or at all). If engaging with this behaviour, as one participant described it:

"of course you're going to lose weight [it's] basic maths" (Participant 01).

Despite feeling reasonably comfortable in this knowledge, however, financial barriers shaped participants' capacity to actually enact food-related or exercise-related strategies. Indeed, several

participants framed the ability to engage with their health-related behaviours as a financial luxury. The cost of eating 'healthy' was notably difficult with *"the cost of food- it's a lot cheaper to be unhealthy and to eat unhealthy food than it is to eat healthy food"* (Participant 15). Having the financial freedom to choose healthy options at the supermarket was unfeasible or unjustifiable for many participants as described by three participants:

"Some days I have to decide between meat or vegetables" (Participant 05)

"Potatoes are more cheaper than broccoli" (Participant 15)

"A 2Litre coke is half the price of 2Litre of milk" (Participant 01)

Several participants had heard about and were keen to embrace new dietary fads/prescriptions, yet understood these were beyond their means. As one woman declared:

"If you are going to do Keto, the biggest barrier is cost because the food- a lot of things you're going to be eating is expensive- nuts, seeds and non- processed foods are expensive generally" (Participant 01).

Several participants highlighted the 'choice' to engage with their desired health behaviours was also subject to time and availability. Spare time, personal time, or available time to spend on themselves was rare, as many other life responsibilities were prioritised before these health-enhancing actions such as *"kids and [work at school]"* (Participant 06).

Low income, or lack of job security meant that the 'choice' of how to spend their own time was replaced with a 'need' for work and ensuring an income: *"I'm a freelancer so I don't get anything like [sick days] so if I don't work, I don't get paid"* (Participant 09) or working to provide an income for their family *"I got a family I've got to work for"* (Participant 10).

Income was prioritised over health-enhancing activities. Participants working hours made accessing health facilities difficult, or impossible, due to their mostly inflexible opening hours, further removing a 'choice' from the individual. As one woman describes, the hydrotherapy pool can only be *"booked for certain times, and so if you work, you're pretty much out"* (Participant 09).

To work around the lack of income or time barriers, personal sacrifices were often made by individuals to achieve their desired health-enhancing activities. However, these 'pro-health' sacrifices often generated potentially 'unhealthy' behaviours. For example, one man drunk straight olive oil as *"it was a more affordable way than buying a piece of salmon"* (Participant 15) and one woman reduced the amount of sleep she got to leave time for her morning walks *"I used to get up really early to do my walks in the morning so I could get it all done"* (Participant 06).

Community based exercise activities were sometimes available, however, access to these was again shaped by individuals' financial situation. Low income precluded buying exercise equipment for personal use. As one participant described *"there's no way I can buy all that sort of stuff myself"* (Participant 05) and that:

"[when] you're on a benefit, you can't afford to things you can't afford. For myself, it would have to come out of my food budget. There's no leeway in it." (Participant 05)

Health-enhancing options provided through general practice and the health system were out of range for many. An inability to afford clinically focused weight management options (such as medication and bariatric surgery) further restricted the 'choices' available to participants, as highlighted by two women: *"I didn't want to go on Duramine again, it was extremely expensive"* (Participant 14) or bariatric surgery *"I can't afford the surgery"* (Participant 16).

The capacity to make health enhancing 'choices' in rural communities, then was shaped by availability of money, time, and pressing responsibilities. As one participant highlighted: *"Sometimes choices are not made, because we have 'a' choice. They're made because they are 'the' choice"* (Participant 08).

Rural Locality

Residing in a rural location was another barrier to participants' ability to engage in health-enhancing activities. Rural locality meant isolation for some communities, which further limited 'choices' available to participants. In more out-of-the-way rural towns, access to common urban privileges, including internet service, public exercise facilities, or a variety of food store options was severely curtailed.

Rural locality was commonly compared with urban area 'choices' through the availability of supermarket choice (or at all) and weight management programme options *"[In the city] there were a lot more things to join"* (Participant 07).

For both Māori and non-Māori participants, eating 'healthy' was *"challenging"* (Participant 12) when there is only a local dairy to shop at which stocked minimal fresh foods. The takeaway shop was positioned as a much more convenient and feasible option as one man described:

"the price for the local shop down here, you can get a feed of fish and chips for about \$7. As opposed to going to the supermarket" (Participant 11).

The 'out-of-town' location made access to supermarkets difficult. Only those with the money, or those *"lucky"* enough to have the luxury of a *"car"* (Participant 05 and Participant 06) could travel to access them. For those who could not travel, the price of low-quality food was enhanced:

"There is always a premium on prices here. Because the [shops] have to bring them in from wherever" (Participant 07)

The inability to make frequent trips to the supermarket for fresh 'healthy' food also jeopardised the quality of the food participants had until their next shop. As one participant expressed:

"That's something to consider too, is the feasibility of getting the stuff fresh because if you only shop once a fortnight or some people only do once a month, they [have to] do a big shop and you don't get all that other good stuff for the rest of the month. You might have it [good] for your first week, but then next three weeks you won't have it" (Participant 06).

Participants were also restricted in their exercise facility access due to the economic difficulties *"there's still a cost to [getting to] them"* and rural locality challenges *"[its] an hour/ hour and a half*

to the nearest one" (Participant 05). Additionally, access to health-enhancing stores or facilities was subject to a participant's available time, whereby work and childcare responsibilities often came first "You can't get it on the day you want, and then I work, and then straight after work I've got my kids" (Participant 10).

Social Norms

Maintaining strong community social connections was important for these participants and abiding by rural social norms trumped weight management engagement for many participants. That is, social relationships were often regarded as more important than engaging with health-enhancing behaviours. For example, being helped by and helping fellow community members was a significant part of a rural lifestyle for many. One participant used her privilege of owning a car to help others less fortunate in the community and would pick up "groceries for three or four people without cars" (Participant 05). Another participant used their privilege of being able to go hunting and fishing and "make up meat packs" and "deliver them to a lot of the Ko Matua (Māori Elders) and places of poverty" (Participant 06) around their area.

Receiving help from the community was crucial for one participant to be able to engage in exercise activities in her home:

"I do have a really old exer-cycle. But it's piled up behind things at home, somebody is coming to help me to with that [and set up]. I'm lucky" (Participant 05).

Rural communities were noted to have a different concept of 'health' compared with their urban counterparts, which was influenced by different sociocultural norms. Weight related health concept differences were also notably different than urban areas as one participant described "in the rural communities, it's okay to be a bit bigger" (Participant 14) and another with a very "different awareness about health" (Participant 07) when compared with the urban capital city of Wellington.

Comparisons of clothing or physical appearance 'expectations' were also different as explained by one woman:

"Maybe 24 is not a normal size [in town], whereas in the small communities, it's fine. Everyone is wearing gumboots and Swandry's [farm clothes] anyway, you can't see anything" (Participant 14)

Rural social expectations also meant community participation was sometimes non-optional and further limited the individual's health-related 'choices'. The act of 'dieting' was viewed as not 'the norm' which could generate social tensions as one participant puts:

"Smaller communities have a lot more community gatherings, which means a lot more food. So it's almost expected that you participate, and you enjoy everything, and you're part of the community. Standing back there on a diet, or that kind of thing, gets looked at sideways" (Participant 14).

Engaging with health-enhancing food options was difficult in social contexts for both Māori and non-Māori participants. Rejecting food was seen as 'offensive' and retaining social connections was prioritised over food choice, as one woman described:

“For me the relationship with the person is more important, so this person has gone to the effort to cook it, so I’ll have to eat something. For me the social aspect is more important than wrecking a friendship over nothing” (Participant 01)

Eating food you don’t want was a way to maintain the social connection that was vital for rural community living. One woman describes the ‘choice’ as being about maintaining a friendship or eating something that is not health-enhancing to her: *“you go to someone’s house and you don’t want the roast potatoes covered in butter”* (Participant 01) but it would be rude not to.

Additionally, specific cultural norms played an integral role in eating behaviours whereby rejecting food offered was unacceptable, further limiting the individual’s ‘choice’:

“I guess for me also, being Māori and in a rural community is a huge issue. You would be completely disrespectful if you went to somebody’s house and they gave you food and you didn’t eat it” (Participant 14)

For both Māori and non-Māori participants, ‘managing choices’ was difficult, because as one woman puts it:

“when you’re confined to a box, you can only choose what’s within it” (Participant 08).

This highlighted that those living in rural communities were aware of the multi-layered barriers of economic, rural locality and social norms they were subject to and how these influenced their ability to engage with their health-related behaviours.

Solutions Known Already

The fourth theme was interesting and unexpected because when participants were asked about their rural experiences with barriers, participants gave solutions to their barriers unprompted. These ‘solutions’ were relative to each specific rural community as no two were the same, but suggestions covered themes such as exercise, diet, health literacy and the involvement of community. As one participant put it-

“What helps Peter won’t help Paul. Especially when it comes to weight management” (Participant 05)

For some this was free access to public exercise areas. One participant describes that a local park with exercise stations (such as a chin up bar, or lunges/ squats square, jumping jacks) is useful for her rural community and is *“more accessible than telling us to go to a gym, or go for a brisk walk”* (Participant 06).

Nutrition knowledge was positioned as important as well:

“[Knowing] where broccoli comes from versus where chicken nuggets come from. Like, what is chicken nuggets versus what is broccoli or chicken breast? I think that

would change people, or maybe their mind, about what they're putting into their body" (Participant 15)

Culturally appropriate food or nutritional education specific to the community was also positioned as a solution that is needed as highlighted by one Māori participant:

"We've gone away from healthy cultural eating. So working with community groups to encourage healthier eating like at Marae's [Māori cultural meeting place] and stuff like that, or community festivals" (Participant 14)

Enabling easier access to health professionals in rural areas was highlighted as a need for improving health also:

"But also making it easier to have- having more community dieticians who are not just at the hospital, but in the medical centres and things like that, so you can easily get to see them" (Participant 09).

Discussion

Overall, the findings in this study highlighted a pervasive lack of 'choice' for rural participants when attempting or desiring to engage with weight management strategies which is relevant to rural areas worldwide. Participants were restricted in which health-enhancing behaviours they could engage with due to their economic income, isolation or accessibility of their rural location and the sociocultural norms of the community they lived in.

Previous research (7, 42, 43) has demonstrated that insufficient income contributes to poverty, housing insecurity, and mental health issues for populations across the world. Whitehead et al. (44) indicates that many rural Waikato clients travel significant distances to access general practice services, and Douthit et al. (45) highlights that those living in rural areas have isolation issues when accessing healthcare. It is little surprise then, that lack of a secure income and accessibility issues also shaped these rural participants' capacity to engage in deliberate exercise and food-related behaviours.

As Kumanyika et al. (46) attests, sociocultural norms influence behaviours of communities and is evident in food and physical activity engagements in many cultures across the world. Sociocultural norms in relation to food behaviours in these rural areas included prioritizing social connections over food choice and the premise that rejecting food someone offers you was 'offensive', which risked jeopardising the social relationship. Further, Howard et al. (36) highlights that sociocultural factors influence the perception of weight status, whereby being 'larger' can be viewed as socially acceptable in rural areas and as such, does not pose a clinical health risk or align with the dominant obesity health discourse (18, 19, 36). On the one hand, not being subject to the 'thin ideal' along with the negative effects of weight trends such as low self-esteem, body dissatisfaction and eating disorder development (47, 48) could be regarded as somewhat freeing from a body image/acceptability point of view. However, the normalisation of obese bodies in rural areas could be acting as a barrier to health-enhancing lifestyles whereby obesity, and consequently increased

negative health risks, are misperceived as signs of wealth and beauty (49) therefore not needing 'management'.

The positioning of solutions found in this research was unexpected and interesting because barriers were there before engagement in a weight management strategy. Previous reports have indicated many failed weight loss attempts are due to an individual's lack of motivation to change (50, 51), however, participants in this study wanted to change and highlighted that there are barriers to weight management that are faced before a strategy is chosen or started. Their first choice of a strategy was usually unavailable to them for economic, sociocultural, or rural locality reasons. This indicates that there are significant difficulties faced before the 'choice' of a weight management plan is made, before a plan can be effective, or before general practice has even offered some form of healthcare. One interesting example was the lack of participants narrative around controlling of portion sizes, which is useful in weight management strategies, and is readily available advice through general practice or online at the MOH website (52) yet not utilised as a feasible strategy. For these participants, finding a feasible weight management strategy was a difficult first step in their weight management journey. For these rural participants, a programme that would 'work' meant one that was economically viable for low income, accessible even if living rurally with less resources, and not cause harm or jeopardise their social connections within their family or community.

Any attempt at intervention in rural areas, whether offered through general practice or not, needs to take into account suitability and feasibility for the lifestyles of the community members. While not an aim of this project, participants expressed knowledge and awareness about what was needed in their community to overcome their barriers. While this was unexpected, it aligns with other rural community research which indicated that people in rural areas are resilient, resourceful, and adaptive (53, 54). Future weight management 'interventions' should use processes that align with community-based participatory research (CBPR) which works in a collaborative manner that strengthens, empowers and attends to social inequalities within a community (55). As highlighted by the participants in this research, no rural weight management initiatives, or recommendations will be effective if the community does not have the money, public spaces, or time to enact them, regardless of whether interventions are within or outside the context of general practice. Any future healthcare efforts with rural communities across the world will need to address, and work within, the restrictive barrier limitations for effective health improvement outcomes, which CBPR has helped to achieve in the past (56). Any interventions will need to be actioned on a community-by-community basis that address the unique local relevance of health problems and ecological barriers (55), which has been demonstrated to improve health outcomes in NZ and Māori specific communities (57-60).

As with any qualitative research, findings cannot be easily generalised, however, this research provides insights into the barriers faced by many communities across the large Waikato region which has not been explored before. This research looked at the barriers experienced by these rural communities, however, obesity is a complex health issue (1) and a deeper interpretivist analysis is needed for a more comprehensive understanding of barriers. Whilst the participants are from rural NZ areas, the findings are relevant to the international rural population who also face similar health inequity and disadvantages in their respective countries. This research acknowledges that themes could be different if designed from an indigenous worldview and that this study was not a Kaupapa Māori design, however, the barriers and themes were identified in both Māori and non-Māori narratives. Whilst this research focused on general practice clients in the Waikato region, minimal discourse in participants' interviews was focused around this general practice context, suggesting further investigation should look into the significance and appropriateness of general practice for

effective weight management outcomes. Future studies should investigate experiences of samples with more participants who identify as male and Pasifika participants. Community specific experiences should be explored with multiple/ all members of each community so a deeper, context specific understanding can be gained to mitigate barriers and improve health outcomes.

Conclusion

This study identified four themes significant to rural general practice clients weight management experiences: economic barriers, rural locality barriers, social barriers, and that participants seemed to already understand the solutions needed to overcome their community specific barriers. Overall, participants had a pervasive lack of weight management strategy 'choice' because of their economic income, isolation or accessibility of their rural location and the sociocultural norms of the community they lived in, which contributed to further health disparities and negative health outcomes. Future weight management initiatives need to be squarely located in communities where people need them and those who design them need a nuanced understanding of the particular barriers rural community clients face.

Abbreviations

NZ – New Zealand

MOH – Ministry of Health

WHO – World Health Organization

BMI – Body Mass Index

GP – General Practitioner

CBPR - Community-based Participatory Research

Declarations

Ethical Approval

Ethical approval was granted by the University of Waikato Human Research Ethics Committee reference HREC2020#38.

Consent for Publication

Not applicable.

Availability of data materials

The datasets generated and analysed during the current study are not publicly available due to the small rural geographical location where data was collected and the potential for identifying participants. The datasets are available from the corresponding author on reasonable request.

Competing Interests

The authors declare that they have no competing interests

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Authors Contributions

This project was part of a wider PhD project for KN under the direct guidance of LC, LB and RS. KN collected and analysed the data for this study with LB. KN and LB collaborated on theme analysis and concepts found with input from LC and RS. KN drafted initial manuscript and LB, LC and RS provided substantial critical insights, reviewed and revised the manuscript. All authors have approved and contributed to the final written manuscript.

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References

1. World Health Organization. Obesity. 2022 Available: <https://www.who.int/topics/obesity/en/>. Accessed 20 June 2022.
2. Ministry of Health. Obesity Statistics. 2021. Available: <https://www.health.govt.nz/nz-health-statistics/health-statistics-and-data-sets/obesity-statistics>. Accessed 24 January 2022.
3. Ministry of Health. Obesity. 2022. Available: <https://www.health.govt.nz/our-work/diseases-and-conditions/obesity>. Accessed 28 February 2022.
4. Triggs S, Mason K, Borman B. Urban-rural Health Comparisons: Key Results of the 2002/03 New Zealand Health Survey: Ministry of Health; 2007.
5. NCD Risk Factor Collaboration. Rising rural body-mass index is the main driver of the global obesity epidemic in adults. *Nature*. 2019;569(7755):260.
6. Hill JO, Wyatt H, Peters JC. Energy balance and obesity. *Circulation*. 2012;126(1):126-32.
7. World Health Organization. Social Determinants of Health: World Health Organization; 2022. Available: https://www.who.int/health-topics/social-determinants-of-health#tab=tab_2. Accessed 20 June 2022.
8. National Health Committee. Rural Health Challenges of Distance Opportunities for Innovation 2010. Available: <http://www.nhc.health.govt.nz>. Accessed 20 June 2022.
9. Swinburn B, Egger, G, Raza, F. Dissecting obesogenic environments: the development and application of a framework for identifying and prioritizing environmental interventions for obesity. *Prev Med*. 1999;29(6):563-70.
10. Cassim S, Kidd J, Rolleston A, Keenan R, Aitken D, Firth M, et al. Hā Ora: Barriers and enablers to early diagnosis of lung cancer in primary healthcare for Māori communities. *Eur J Cancer Care*. 2021;30(2):e13380.
11. Jani R, Rush E, Crook N, Simmons D. Availability and price of healthier food choices and association with obesity prevalence in New Zealand Māori. *Asia Pac J Clin Nutr*. 2018;27(6):1357-65.
12. Mello MM, Rimm EB, Studdert DM. The McLawsuit: the fast-food industry and legal accountability for obesity. *Health Aff*. 2003;22(6):207-16.
13. Pearce J, Blakely T, Witten K, Bartie P. Neighborhood deprivation and access to fast-food retailing: a national study. *Am J Prev Med*. 2007;32(5):375-82.
14. Davis-Wheaton J. Breaking down health barriers in rural areas. *Kai Tiaki: Nursing New Zealand*. 2013;19(2):2.
15. Bhurosy T, Jeewon R. Pitfalls of using body mass index (BMI) in assessment of obesity risk. *Cur Res Nutr Food Sci*. 2013;1(1):71-6.
16. Ministry of Health. Measuring Weight. 2018. Available: <https://www.health.govt.nz/your-health/healthy-living/food-activity-and-sleep/healthy-weight/measuring-weight>. Accessed 15 February 2022.

17. Ministry of Health. Clinical Guidelines for Weight Management in New Zealand Adults. 2017. Available: <https://www.health.govt.nz/publication/clinical-guidelines-weight-management-new-zealand-adults>. Accessed 20 June 2022.
18. Johnson F, Beeken RJ, Croker H, Wardle J. Do weight perceptions among obese adults in Great Britain match clinical definitions? Analysis of cross-sectional surveys from 2007 and 2012. *BMJ Open*. 2014;4(11).
19. Wong C, Harrison C, Bayram C, Miller G. Assessing patients' and GPs' ability to recognise overweight and obesity. *Aust N Z J Public Health*. 2016;40(6):513-7.
20. Brewis AA. *Obesity: Cultural and biocultural perspectives*: Rutgers University Press; 2010.
21. Brewis AA, McGarvey ST, Jones J, Swinburn BA. Perceptions of body size in Pacific Islanders. *Int J Obesity*. 1998;22(2):185-9.
22. Campos PF. *The obesity myth: Why America's obsession with weight is hazardous to your health*: Penguin; 2004.
23. Gard M. Truth, belief and the cultural politics of obesity scholarship and public health policy. *Crit Public Health*. 2011;21(1):37-48.
24. Gard M. 5. Neoliberalism, the 'obesity epidemic' and the challenge to theory. In *Ethical Consumption*. 2013. p. 71-84. Routledge.
25. Guinness World Record Limited. Heaviest Man Ever. 2020. Available: <https://www.guinnessworldrecords.com/world-records/heaviest-man>. Accessed 5 December 2021.
26. National Association to Advance Fat Acceptance. NAAFA. 2020. Available: <https://naafa.org/>. Accessed 20 June 2022.
27. Norman K, Chepulis L, Burrows L, Lawrenson R. Adult obesity management in New Zealand general practice: a review. *J Prim Health Care*. 2021.
28. Obesity Canada. *Canadian Adult Obesity Clinical Practice Guidelines*: Obesity Canada. 2022. Available: <https://obesitycanada.ca/guidelines/chapters/>. Accessed 20 June 2022.
29. National Health and Medical Research Council. *Clinical Practice Guidelines for the management of overweight and obesity in adults, adolescents and children in Australia*. 2013. Available: <https://www.nhmrc.gov.au/about-us/publications/clinical-practice-guidelines-management-overweight-and-obesity>. Accessed 20 June 2022.
30. National Institute for Health and Care Excellence (NICE). *Weight management: lifestyle services for overweight or obese adults*. Public health guideline [PH53]: NICE; 2014. Available: <https://www.nice.org.uk/guidance/ph53>. Accessed 20 June 2022.
31. Moyer VA. Screening for and management of obesity in adults: US Preventive Services Task Force recommendation statement. *Ann Intern Med*. 2012;157(5):373-8.
32. Hebden L, Balestracci K, McGeechan K, Denney-Wilson E, Harris M, Bauman A, et al. 'TXT2BFIT' a mobile phone-based healthy lifestyle program for preventing unhealthy weight gain in young adults: study protocol for a randomized controlled trial. *Trials*. 2013;14:75.

33. Te Morenga L, Pekepo C, Corrigan C, Matoe L, Mules R, Goodwin D, et al. Co-designing an mHealth tool in the New Zealand Māori community with a “Kaupapa Māori” approach. *AlterNative: An International Journal of Indigenous Peoples*. 2018;14(1):90-9.
34. Gudzone KA, Doshi RS, Mehta AK, Chaudhry ZW, Jacobs DK, Vakil RM, et al. Efficacy of commercial weight-loss programs: an updated systematic review. *Ann Int Med*. 2015;162(7):501-12.
35. Haynes A, Kersbergen I, Sutin A, Daly M, Robinson E. A systematic review of the relationship between weight status perceptions and weight loss attempts, strategies, behaviours and outcomes. *Obes Rev*. 2018;19(3):347-63.
36. Howard NJ, Hugo GJ, Taylor AW, Wilson DH. Our perception of weight: Socioeconomic and sociocultural explanations. *Obes Res Clin Pract*. 2008;2(2):125-31.
37. Whitehead, J., Davie, G., de Graaf, B., Crengle, S., Fearnley, D., Smith, M., Lawrenson, R., & Nixon, G. (2022, In press). Defining rural in Aotearoa New Zealand: A novel geographic classification for health purposes. *N Z Med J*.
38. Emmel N. Sampling and choosing cases in qualitative research: A realist approach. London, England: Sage; 2013 [cited Purposeful Sampling pages 33-44]. Available: <https://methods.sagepub.com/book/sampling-and-choosing-cases-in-qualitative-research>. Accessed 5 December 2021.
39. Pyett P, Research VKH, Unit CD. Towards reconciliation in Indigenous health research: The responsibilities of the non-Indigenous researcher. *Contemp Nurse*. 2002;14(1):56-65.
40. Braun V, Clarke V. Using thematic analysis in psychology. *Qual Res Psychol*. 2006;3(2):77-101.
41. Braun V, Clarke V. To saturate or not to saturate? Questioning data saturation as a useful concept for thematic analysis and sample-size rationales. *Qual Res Sport, Exerc Health*. 2021;13(2):201-16.
42. Sederer LI. The social determinants of mental health. *Psychiatr Serv*. 2016;67(2):234-5.
43. Singh A, Daniel L, Baker E, Bentley R. Housing Disadvantage and Poor Mental Health: A Systematic Review. *Am J Prev Med*. 2019;57(2):262-72.
44. Whitehead J, Pearson AL, Lawrenson R, Atatoa-Carr P. Spatial equity and realised access to healthcare—a geospatial analysis of general practitioner enrolments in Waikato, New Zealand. *Rural Remote Health*. 2019;19(4).
45. Douthit N, Kiv S, Dwolatzky T, Biswas S. Exposing some important barriers to health care access in the rural USA. *Public Health*. 2015;129(6):611-20.
46. Kumanyika S, Taylor WC, Grier SA, Lassiter V, Lancaster KJ, Morssink CB, et al. Community energy balance: A framework for contextualizing cultural influences on high risk of obesity in ethnic minority populations. *Prev Med*. 2012;55(5):371-81.
47. Hawkins N, Richards PS, Granley HM, Stein DM. The impact of exposure to the thin-ideal media image on women. *Eat Disord*. 2004;12(1):35-50.
48. Couch D, Thomas SL, Lewis S, Blood RW, Holland K, Komesaroff P. Obese people's perceptions of the thin ideal. *Soc Sci Med*. 2016;148:60-70.

49. Bosire EN, Cohen E, Erzse A, Goldstein SJ, Hofman KJ, Norris SA. 'I'd say I'm fat, I'm not obese': Obesity normalisation in urban-poor South Africa. *Public Health Nutr.* 2020;23(9):1515-26.
50. Sonntag U, Brink A, Renneberg B, Braun V, Heintze C. GPs' attitudes, objectives and barriers in counselling for obesity—a qualitative study. *Eur J Gen Pract.* 2012;18(1):9-14.
51. Armstrong M, Mottershead T, Ronksley P, Sigal R, Campbell T, Hemmelgarn B. Motivational interviewing to improve weight loss in overweight and/or obese patients: a systematic review and meta-analysis of randomized controlled trials. *Obes Rev.* 2011;12(9):709-23.
52. Ministry of Health. Eating and Activity Guidelines for New Zealand Adults. 2020. Available: <https://www.health.govt.nz/publication/eating-and-activity-guidelines-new-zealand-adults>. Accessed 20 June 2022.
53. Young N. Responding to rural change: Adaptation, resilience and community action. In: Shucksmith M, Brown D (Eds); *Routledge International Handbook of Rural Studies*. Routledge;2016. p.668-79.
54. Rapaport C, Hornik-Lurie T, Cohen O, Lahad M, Leykin D, Aharonson-Daniel L. The relationship between community type and community resilience. *Int J Disaster Risk Reduct.* 2018;31:470-7.
55. Coghlan D, Brydon-Miller M. Community-Based Participatory Research. *Sage Encyclopedia of Action Research*. 2014. Available: <https://dx-doi-org.ezproxy.waikato.ac.nz/10.4135/9781446294406.n72>. Accessed 5 December 2021.
56. Salimi Y, Shahandeh K, Malekafzali H, Loori N, Kheiltash A, Jamshidi E, et al. Is Community-based Participatory Research (CBPR) Useful? A Systematic Review on Papers in a Decade. *Int J Prev Med.* 2012;3(6):386-93.
57. Eggleton K, Stewart L, Kask A. Ngātiwai Whakapakari Tinana: strengthening bodies through a Kaupapa Māori fitness and exercise programme. *J Prim Health Care.* 2018;10(1):25-30.
58. Verbiest MEA, Corrigan C, Dalhousie S, Firestone R, Funaki T, Goodwin D, et al. Using codesign to develop a culturally tailored, behavior change mHealth intervention for indigenous and other priority communities: A case study in New Zealand. *Transl Behav Med.* 2018;9(4):720-36.
59. Kent L, Morton D, Hurlow T, Rankin P, Hanna A, Diehl H. Long-term effectiveness of the community-based Complete Health Improvement Program (CHIP) lifestyle intervention: A cohort study. *BMJ Open.* 2013;3(11).
60. Wright N, Wilson L, Smith M, Duncan B, McHugh P. The BROAD study: A randomised controlled trial using a whole food plant-based diet in the community for obesity, ischaemic heart disease or diabetes. *Nutr Diabetes.* 2017;7:10.

Chapter 9: Client Experiences with Weight Management

Study 3: Client In-depth Qualitative Interviews

Overview

This chapter extends the knowledge in chapter 8 and explores the experiences of weight management in rural contexts from the client perspective. This is important to explore as 'obesity' can be experienced differently by all clients and needs to be understood better if barriers are to be mitigated and inequities reduced.

Title: Understanding Weight Management Experiences from Patient Perspectives: Qualitative Exploration in General Practice

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No conflicts of interests.

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Abstract

Background: Obesity is a complex health issue affecting the quality of life of individuals and contributing to an unsustainable strain on healthcare professionals and national health systems. National policy guidelines indicate that general practice is best suited to deliver obesity healthcare, however obesity rates continue to rise worldwide indicating interventions are ineffective in this space. The aim of this study was to explore the weight management experiences from patient perspectives. **Methods:** This qualitative study used semi-structured interviews with 16 rural Waikato general practice patients. Interviews were analysed using reflexive thematic analysis. **Results:** Four themes were identified: Inconsistent Information, Significance of Holistic Factors, Obesity Centre Need, and Education. Participants expressed frustration at contradictory health messages, commercial company and 'expert' definition distrust, and that 'holistic' aspects to health significant to the weight management journey were unable to be addressed in general practice. **Conclusion:** Whilst primary care is positioned as suitable for delivering obesity healthcare, this study found that participants do not perceive general practice to be equipped to deliver this care. Instead, participants argued for a specialist obesity centre capable of meeting all their obesity healthcare needs. Further, wider issues including on-line commodification of health and neo-liberal capitalism - factors that exploit people with a stigmatised health issue - can cause further harm to the participant. A radical modernisation of education, information, and resources from regulated, qualified and 'trusted' healthcare professionals who can provide safe, non-stigmatising supportive services is recommended to meet the unique and changing food climate, reduce obesity rates and improve health outcomes.

Keywords: Obesity, Primary Care, Client View, Barriers, Effective Weight Management, New Zealand, Obesity Healthcare

Introduction

Obesity affects over 650 million people across the world (1) and leads to further physical, psychosocial and cultural health issues (2, 3). Obesity and its related comorbidities reportedly cost over US\$990bn globally (4), which is unsustainable and threatens to bankrupt national health systems, including the UK National Health Service (NHS) (5). The predominant clinical view of obesity is that it presents a significant health risk. However, many other perspectives of obesity exist, including obesity not being classified as a health risk as well as obesity being the preferred 'ideal' in some cultures (6-8) and therefore not warranting clinical 'intervention' or 'treatment'. However, obesity is a stigmatized health concern in western contexts with discrimination reportedly experienced in all levels of life (9-13) further contributing to a reduced quality of life (4).

The World Health Organization defines obesity as preventable and reversible through effective weight management strategies (14). The national health systems in the UK, Canada, Australia, America and New Zealand (NZ) (15-19) position primary care as suitable for obesity healthcare. Guidelines recommend routine identification and treatment of obesity in primary care to reduce obesity rates (16, 20). The Body Mass Index (BMI) is (while arguably a flawed tool (21) used to measure obesity levels in primary care, with a healthy weight range classed as 18.5-24.9, overweight between 25- 29.9, and obese over 30 (22). However, BMI is reported to be under-recorded and weight loss interventions under-referred (23) in general practice. Weight management options are available through general practice, privately, through commercial avenues, or internet-based sources (19, 24, 25). In NZ, primary care offers weight management advice via national guidelines (19). Secondary care referral options for a clinician include dietitian consultations, weight management medication, hospital weight management clinic and bariatric surgery (19). In so saying, there are limited publicly funded spaces in these programmes, and options such as bariatric surgery, low calorie diet plans or exercise establishment memberships, are increasingly being offered to patients who can self-fund or pay for private health insurance (26, 27). However, many people at risk of developing obesity live in high-deprivation and are financially unable to access this care (28), which can contribute to increasing the health inequity gap (29).

Achieving weight management has been argued to be simply an issue of balancing an 'energy in versus energy out' equation (30). However, evidence indicates it is more complex, due to a myriad of additional contributing factors, including the obesogenic environment, psychological factors, sociocultural norms, adverse or traumatic life events, colonisation impacts (for indigenous populations) and social determinants of health (2, 6, 31-34). While acknowledging the significant role modern obesogenic environments and an individual's choice to engage with weight management plays, one of the most effective ways to achieve weight management is through a combination of diet, exercise, and behavioural change conducted in culturally appropriate ways (19, 35). This combination and balance of factors needs to be calibrated to the individual for suitability as no one diet suits all. Despite this literature, obesity rates continue to rise worldwide, including the UK, suggesting there are barriers as current weight management interventions in general practice are ineffective.

NZ has high obesity rates with 34% of adults classed as obese (28). There is significant health inequity experienced by the Indigenous Māori population in NZ with 51% obesity rate, as well as Pacific Island populations in NZ at 71%(28). While effective management of weight is complicated and influenced by many compounding factors both within and outside the scope of general practice, Māori also face additional challenges when engaging with public health systems such as experiences of hostility, alienation, racism and trying to navigate a health system that does not align with a Māori

health worldview reported (36). Yet, there is limited literature that focus on the experiences of weight management in general practice from the patient perspective (37-41). NZ populations at high risk of developing obesity include rural communities, Pacific and Indigenous Māori populations, and those living in high-deprivation areas who experience inequities (28, 42). The aim of this study was to explore the patient perspectives of their weight management experiences in general practice to identify barriers and ways to improve health outcomes. It is hoped that this study will suggest new ways to offer weight management strategies within general practice and the community.

Method

Participants

Participants were recruited through rural general practices.. Participant criteria included: aged >25years, currently or recently resided in a rural Waikato location, not on any weight influencing medication, and identified as having had some experience with weight management in general practice context. While acknowledging the subjective nature of obesity and the definition of 'obesity' being socio-culturally influenced (43-45), for the purposes of this research the clinical measurement of obesity was used to demarcate weight and identify participants who were eligible for this study (BMI of >30) (46).

Data Collection

Rural general practices and Māori healthcare providers across the Waikato region were contacted via phone and email and invited to participate. They were asked to identify and pass on the female researchers (KN) details (or gain consent to be contacted by the researcher) to any of their patients they saw that fit the criteria for this study. Seven participants were recruited through this avenue. Due to the potential that some patients who fit the criteria of the study may not have visited their general practice recently, a snowballing strategy (47) was utilised. All recruited participants were invited to share the researchers details to those in their community they knew who might want to take part. Ten participants were recruited from this method across the Waikato region. Purposeful sampling was conducted towards the end to recruit males, as only one out of the first 14 participants was male. Three males were recruited, however one male participant was excluded during the interview weight gain was found to be influenced by medication which was an exclusion criterion. A total of 16 participants were recruited and the demographic details are in Table 1.

Information sheets and consent forms were given to all participants, rapport was built with the participants, the reasons behind why the study was being conducted, as well as any questions or concerns answered before consent was signed and interviews commenced. Interviews were held in person or via Skype at a time and place preferred by the participant (48). A Māori cultural advisor and GP was included and contributed by guiding the research process, including processes such as karakia (Māori prayer), whakawhanaungatanga (process of establishing relationships), koha use (gift and gratitude for participant), and contributing to interpretation of Māori narratives in a western health context. While the interviewer identifies as non-indigenous, she has lived experience with significant weight management, and extensive experience in qualitative interviews and analysis, including awareness of the limitations of her own experiences when collecting or interpreting indigenous narratives and actively sought guidance throughout the study. These factors contributed to reducing power imbalances. No participants wanted copies of transcripts. Ethical approval was granted by the University of Waikato Human Research Ethics Committee reference HREC2020#38.

Interviews were semi-structured and guided by a set of questions to ensure that all participants were asked the same open-ended / exploratory questions, and to ensure participants had agency to share their story in their own words. The open-ended interview questions included: ‘could you please tell me about your experience with weight management?’ and ‘could you please tell me about your experience with any barriers to weight related health engagements?’ All participants were encouraged to speak about their experience for as long as they wanted to. Interviews were audio recorded for later transcription, notes were taken by interviewer, participants were thanked and compensated for their time with a \$30 voucher.

Analysis

All interview data was transcribed verbatim and analysed using reflexive thematic analysis (49). Each transcript was printed out, read and re-read by the researcher for immersion in the data. In the right-hand margin of each transcript, sections of conversation were analysed and labelled with no pre-defined categories, enabling the concepts that were significant to the participants’ experiences to be identified and highlighted. These ideas and interpretive notes were used for the codes of this study and were checked by second researcher. Each transcript was analysed in turn, and then re-analysed for any missing codes. The Māori cultural advisor read and ensured that appropriate interpretation occurred for all participants identifying as Māori. Once all codes were listed, any redundant or double-up codes were removed. KN, RK, and LB were all involved with analysis and formulation of themes. Whilst Braun and Clarke highlight that the ability to achieve data saturation is situated and subjective (50), this analysis found no new themes when revisiting the transcripts and reflecting on codes already identified.

Results

Table 8: Participant Demographic Data

Demographic	Participants (n)
Male	3
Female	13
Māori / NZ European and Māori	8
Non-Māori	8
Age 25- 45 years	8
Age 46-70 years	8

All interviews lasted up to 60 minutes. Six initial themes were formed from the coding lists and after reflection of the transcripts, four overarching themes were identified: Inconsistent Information, Significance of Holistic Factors, Obesity Centre Need, and Education.

Inconsistent Information

Inconsistent information around food dietary advice was expressed as significant in the weight management process. One woman reported “*Knowing how many calories to eat is what I struggle with*” (Participant 04). Despite accessing multiple health ‘sources’ and ‘professionals’, the actual calorie deficit amount for her weight management journey was still a mystery – making her weight goals unachievable before even starting her diet plan:

“What actually is it? You put it in my fitness pal [app], it's 2500 [calories]. You do a [gym] body scan, it's 2700. I went to [commercial nutritionist] it was 2200. There's like 200-300-500 calorie difference- it's a whole meal!” (Participant 04)

Popular diets such as Ketogenic (low carbohydrate diet (19)) provoked tension for some. One participant described concern about going on a Keto diet saying that it is *“actually bad for you”* (Participant 09) after being advised to try it. Another participant declared that the concept of only eating fats to lose fat went against his ‘general’ understanding of weight loss whereby *“It's kind of like the opposite of everything you learn of good nutrition”* (Participant 17).

Assessing quality and reputable information became a *“struggle”* (Participant 04) as participants described many self-advertised weight related health ‘professionals’ (outside general practice and commonly in the commercial sector) as unqualified to give accurate dietary advice. Participants expressed that the ability to rely on dietary information became unachievable as there was *“so much misinformation available to everyone”* (Participant 09).

Confusion around what to believe caused further tension:

“There is contradictory information out there” (Participant 09)

The consistent misleading or confusing information was expressed with feelings of helplessness and powerlessness to achieve their weight goals. As summarised by one participant:

“Where- what do you trust?” (Participant 09)

Visiting their general practice for dietary advice was not actioned by all participants. Some participants highlighted that they did not think their GP would be a place for this type of health advice:

“Going to the GP would be like a last resort” (Participant 11)

And sometimes actively avoided:

“I don't think I've ever gone to a GP [solely for weight management advice]- but I don't think I would, because I don't think it would benefit me. My perspective of it is I feel like all they would say is ‘eat better and go to the gym’ And that's what I've been currently trying to do” (Participant 04)

Experiences with weight management options through a GP varied. Medication was *“extremely expensive”*, made one participant *“violently ill”* (Participant 14) and others had heard *“traumatizing things about the side effects”* (Participant 11) of particular medication. GPs were approached for bariatric surgery as one participant described:

“I had to be GP referred to go privately” (Participant 14).

Commercial weight management programmes were viewed with scepticism as one woman reported:

“There is all these different companies that are just trying to make money and like, [commercial business] they're all businesses, they're all trying to make money. Like, yes they are trying to ‘help’ people, but they're also a business that's trying to make money” (Participant 11)

Advertising of weight management through ‘X week challenges’ from commercial gyms implied ‘expertise’. As one participant highlighted this presumed ‘expertise’ ended up being generalised nutritional advice and she got *“really nothing out of it”* (Participant 04). Her failure to reap any rewards from this advice generated further disappointment, frustration and depression:

“How is it that I followed the nutrition plan and worked out for like four or five days a week and I lost 800 grams?! I was just so heartbroken. I was like -what's the point? I'm trying so hard and it's just not working. So then I could that kind of sent me back on a downward spiral” (Participant 04)

Further confusion and tension surrounded the definition of a business operating as a weight management ‘expert’ as there was little transparency in terms of qualifications. Trying to identify who was a reliable information resource among all the available sources was difficult for many. One participant highlighted their frustration at wanting to find a reliable weight management professional:

“I said to [doctor] I've been to a nutritionist, and it didn't really fit me what that nutritionist has given me. I don't know enough information about a difference between a nutritionist and a dietitian, do you think it would be better for me to go to a dietitian, like I'm happy to pay to go I just don't know the differences easily. Or do I try a different nutritionist? Like, I want to get my food right!” (Participant 04)

Significance of Holistic Factors

For those who had achieved their weight loss goals, or who had achieved some weight loss in the past, a healthy mind set was crucial. Prior to losing weight, understanding why she ate was important for her success and adherence to her choice of calorie deficit plan:

“I had to learn the association of what I did when I was depressed or feeling down, you know, I ate.” (Participant 01).

Recognising personal relationships with food and eating behaviour were vital for any dietary changes to take place. Emotional connections to food, emotional eating, or using food to feel ‘good’ were identified as reasons for weight gain in some participants' journeys:

“I have changed my entire mental health, mental shift and food association with mental health so I don't need chocolate to make me feel good anymore.” (Participant 01)

“I think people's mental health has a direct impact on weight loss. And when you're depressed, you just eat crap. You eat crap, because you feel like crap and you think you're crap” (Participant 14)

Psychological aspects to weight management were also recognised as contributors to eating behaviour:

“Part of the problem for me is my depression and anxiety. When they play up I tend not to pay as much attention to what I'm eating and not eating and things like that” (Participant 09)

Participants reported the need for a ‘holistic’ view of weight management that incorporated many aspects to weight management and *“not just my diet”* (Participant 08) as it would *“just be a better way”* (Participant 09). One participant indicated:

“[I need to] have my complete entire well being checked out- my mind, my spirituality, my environment” (Participant 08)

Whilst another highlighted that balancing both physical and holistic aspects to weight management was key for effectiveness:

“[It's] very holistic, but also very scientific. This is why you do what you do. And this is why your body is reacting the way it's reacting” (Participant 14)

Feelings of failure were significant to further psychological harm with one participant reporting the whole experience being *“really disheartening”* (Participant 02). Another participant described being *“stuck in a cycle”* (Participant 04) of failed diets and that:

“It makes me feel like shit, to be fair, because I feel like I'm doing something wrong” (Participant 04)

Obesity Health Centre

Participants expressed a desire for a service that could meet their weight management needs. The concept of a *“health centre rather than a medical centre”* (Participant 07) or *“weight care centres”* (Participant 06) was reported as a desired ‘place to go’ for these participants for weight management needs.

Weight management centres were positioned as a service that could provide reputable and reliable information as well as access to qualified health professionals who could help these participants. One woman described that having *“more access to information”* (Participant 14) was crucial, while another participant highlighted:

“There needs to be somewhere where there is clear information from the government or actually from the medical professionals, saying, ‘This is what you can do to be better’” (Participant 09)

Participants reported a significant desire and expectation that health professionals are proficient in the complexities of weight management:

“Someone who is qualified and done research and knows what they're talking about, and had experience with this, people, situations, so they know not every [diet] works for the same people” (Participant 04)

“I want to be able to have access to a practitioner that understands the multi-dimensional layers to obesity” (Participant 08)

Expectations on a single health professional to provide all the needs for weight management were low due to the variances of weight management needs. Difficulties with trying to deal with a health issue that is *“not just black and white”* (Participant 02) with a GP only having *“10 minutes to make that assessment”* (Participant 16) was highlighted as an issue that needs addressing. One participant expressed:

“It's probably really hard to find someone like that [to cover complexities]. But if one person can't do it, get a team, you know?” (Participant 02)

Education

Whether participants had achieved their desired weight, or were still on the weight management journey, all participants positioned education about healthy living as important.

The change in societal norms was described in many forms. One participant highlighted disgust that advertising and processed foods companies are using discourse such as *“organic sweetening agent e105a”* as a way of *“hiding what [sugar level] is in”* (Participant 03) their food products.

Education around processed food labels was positioned as vital to one participant's success at weight management:

“Anything with a square on it explaining what's in it, to me that's a warning sign” (Participant 03)

Education in schools was positioned as crucial to save the next generation from suffering from obesity. Teaching them how to cook food that *“could actually fuel you and taste good”* (Participant 14) and the need for teaching to be about *“healthy kai (food)”* (Participant 06) was important. As one participant expressed, the youth are *“the victim of the sugar”* (Participant 03).

Awareness that the weight management *“wasn't a diet- it was a lifestyle”* (Participant 01) was crucial for long-term effectiveness. As one participant indicated:

“Teaching about healthy food choices in teaching about healthy, what healthy bodies actually are is important” (Participant 09)

Discussion

Summary

This study demonstrated many aspects to the patient experience of weight management including not only the need for a suitable calorie deficit dietary plan, but also addressing holistic aspects to their health such as psychological or cultural related experiences with weight. Expressions of confusion, frustration and deception around weight management advice and commercial sources of 'help' were found to be pervasive. Patients reported wanting education from 'trust-worthy' qualified professionals who could meet their wider health needs, a feat in which a GP could not achieve in their small 10-minute consultation. Surprisingly, minimal discourse linked weight management to general practice or interventions and some explicitly highlighted they would not consider visiting their GP for weight advice.

Strengths and Limitations

As with any qualitative study, the unconscious bias from researchers can influence design and analysis. Recognising the potential for bias, this study was designed and analysed by a team of academic, general practitioner, and lived obesity experience researchers which actively included processes of cultural awareness and reflexivity throughout the research entirety. While qualitative findings cannot be generalised, this research provides novel insights to the experience of weight management from the patient perspective, which is imperative to understand if any future weight management interventions are to be effective. While the sample size was small and rurally based, it is relevant to all people attempting weight management. The research achieved saturation in the interviews with themes consistent across narratives and no new themes emerging. However, it is acknowledged that whilst the experiences and themes from both Māori and non-Māori participants were similar throughout this study, using an indigenous health worldview lens would likely elicit a wider range of themes and understandings for Māori participants.

Comparison with existing literature

An unexpected finding was the lack of discourse around weight management experiences in general practice, despite this being the context for this research. Many patients positioned general practice as unsuitable to deliver effective weight management healthcare, a perspective that contradicts the national health policy and clinical guidelines in the UK, America, Australia, Canada and NZ (15-19). When general practice was talked about, it was positioned with negative clinical options (such as medication and bariatric surgery), and an overall inability to provide the obesity management patients desired. For example, addressing the holistic needs, including spiritual and cultural factors, to weight management and lifestyle habits was positioned as unsuitable for the time-poor consultation with a GP. Further, some patients specifically stated they would not even engage with their GP for weight management as it was viewed as 'unhelpful', which supports one UK study where patients did not see the GP or NHS as appropriate for this healthcare (51). It is little wonder that obesity and obesity comorbidity rates are increasing in the UK, and worldwide, given that not only do GPs experience many barriers to effective obesity healthcare delivery in their practice (52-54) but their patients potentially do not come to them for this healthcare in the first place.

Instead, many patients who chose to engage with weight management did so through non-general practice avenues such as fad diets or commercial companies. However, significant dis-trust, confusion, and feelings of deception were associated with these options. Commercial companies selling 'personalised' programmes for weight loss results that premised on very little 'science' were commonly reported throughout these narratives. With obesity stigma and the 'thin ideal' (a body image concept that is promoted to be aspired to) being pervasive in Western culture (6, 12, 13, 55) it is unsurprising that commercial endeavours such as private companies and food marketing tactics (56) would be used to exploit those who are ostracized and vulnerable. One UK study (51) explored

patients experiences of a GP (and therefore 'reliable') referral to commercial weight loss programmes was welcomed as patients viewed weight as more lifestyle issues requiring a non-medical solution. However, participants in this study highlighted that their commercial weight management programmes failed to meet their comprehensive needs, and only addressed one layer of the complex weight management experience (either food, exercise or behaviour change) which contradicts the national guidelines and effective weight management literature in the UK and NZ (2, 16, 19).

Issues around neo-liberal capitalist behaviours were also noted by participants whereby products consistently acted in ways that 'hide' sugar content and using language to imply they are qualified to give specialist advice (nutritionist versus dietitian for example), further deceiving the individual seeking help. Whilst some participants understood the economical concepts of weight loss programmes, the 'service' or 'product' they paid for did not meet their expectations despite being advertised as 'effective'. This generated more confusion about where to go for help, what to 'believe' anymore or who the 'experts' actually are for all patients. Clear information about nutrition and exercise was desired by these patients supporting previous findings (37, 57). However, this study found the information or 'education' sought after transcended the 'reductionist' nutritional or lifestyle weight management advice of previous findings (19, 30, 41) and included factors such as how to navigate this current obesogenic climate and avoid consumer 'traps'.

Surprisingly, patients called for the establishment of an obesity healthcare centre. This 'one-stop obesity shop' was positioned to provide holistic obesity services that could extend beyond a GP (in)capability and not have a financial interest in repeat business that commercial avenues were viewed to have. Facilitating access or providing care for the myriad of factors that are recognised to contribute to obesity including culturally appropriate services for indigenous populations was stressed as crucial for successful weight management. Previous literature has also indicated that trauma and adverse life events can contribute to weight (34), indicating that obesity healthcare could benefit from including psychological services such as counselling as a way to improve some patients' relationships with food and extend beyond programmes that only include dietary manipulation and exercise increase. In addition, this centre could mitigate the confusion and 'dis-trust' experienced by patients through employing regulated health professionals, or 'actual experts' that could offer reliable 'trust-worthy' weight advice. While the capacity for general practice to provide obesity healthcare has been questioned in previous urban literature with many barriers identified (44-47, 51-53), this study extends this need for a specialised obesity referral service to indigenous and rural areas who experience significant health inequities.

Implications for clinical practice

This study found the patients perspective did not fully align with the national position that general practice is 'best suited' for effective obesity healthcare. Future research should investigate the percentage of patients utilising general practice for weight management as these efforts could be mis-placed. Further, an appraisal focused on the suitability of general practice to provide obesity healthcare is strongly recommended, as this was found to be questionable and potentially, hindering obesity reduction efforts before attempts are even made.

In addition, research into the feasibility of an obesity centre establishment is recommended as this could reduce the strain on general practice and provide patients with comprehensive, culturally appropriate healthcare. Many participants felt that their 'holistic' obesity related health needs were not met in their general practice and desired access to a helpful referral pathway which was positioned as a 'trustworthy' source of information through their primary care clinician. Potentially,

an effective primary care health service for obesity could be one that supports a specialised secondary service that can meet the 'holistic' health needs of patients. Previous literature has indicated that primary care is a valuable system that can contribute to better health outcomes and equity (58). Investigation into the development of obesity health services and how the division of work between primary and secondary care should be explored for efficacy purposes in the future.

Public health education on obesity management urgently needs updating to include wider aspects to weight management besides calorie manipulation. Education needs to include factors within the reach of the individual, such as the ability to comprehend food labels, understanding biomedical responses to lifestyle factors, cultural influences on food consumption, and an awareness of personal psychosocial behavioural connections with food. However, the wider political climate also needs to be understood, regulated and held accountable for the factors that directly influence the individual's ability to engage with a healthy lifestyle.

List of Abbreviations

UK – United Kingdom

NZ – New Zealand

BMI – Body Mass Index

GP – General Practitioner

Declarations

Ethical approval and consent to participate

Ethical approval was granted by the University of Waikato Human Research Ethics Committee reference HREC2020#38. Participants all signed informed consent before participation. All methods were performed in accordance with the relevant guidelines and regulations of University of Waikato and Human Research Ethics.

Consent For Publication

Not applicable

Data Availability

The datasets generated and analysed during the current study are not publicly available due to the small rural geographical location where data was collected and the potential for identifying participants. The datasets are available from the corresponding author on reasonable request.

Competing Interests

None

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Author Contributions

This project was part of a wider PhD project for KN under the direct guidance of LC,

LB, RK and RS. KN collected and analysed the data for this study with LB and RK. KN and LB collaborated on theme analysis and concepts found with input from LC and RS. KN drafted initial manuscript and LB, LC and RS provided substantial critical insights, reviewed and revised the manuscript. All authors have approved and contributed to the final written manuscript.

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References

1. World Health Organization. Obesity 2022. <https://www.who.int/topics/obesity/en/>. (accessed 25 May 2022).
2. Bell R, Smith C, Hale L, Kira G, Tumilty S. Understanding obesity in the context of an Indigenous population—A qualitative study. *Obes Res Clin Pract*. 2017; 11(5): 558-66.
3. Ministry of Health. Obesity 2022. <https://www.health.govt.nz/our-work/diseases-and-conditions/obesity>. (accessed 26 Feb 2022).
4. World Obesity. Obesity: missing the 2025 global targets 2020. <https://www.worldobesity.org/resources/resource-library/world-obesity-day-missing-the-targets-report>. (accessed 20 May 2022).
5. Boseley S. Global cost of obesity-related illness to hit \$1.2tn a year from 2025. *The Guardian*. 2017.
6. Brewis AA. *Obesity: Cultural and biocultural perspectives*: Rutgers University Press; 2010.
7. Campos PF. *The obesity myth: Why America's obsession with weight is hazardous to your health*: Penguin; 2004.
8. National Association to Advance Fat Acceptance. NAAFA 2020. <https://naafa.org/>. (accessed 20 May 2022).
9. Brewis AA. Stigma and the perpetuation of obesity. *Soc Sci Med*. 2014; 118: 152-8.
10. Tomiyama AJ, Carr D, Granberg EM, Major B, Robinson E, Sutin AR, et al. How and why weight stigma drives the obesity 'epidemic' and harms health. *BMC Medicine*. 2018; 16(1): 1-6.
11. Puhl R, Brownell KD. Bias, discrimination, and obesity. *Obes Res*. 2001; 9(12): 788-805.
12. Puhl RM, Himmelstein MS, Pearl RL. Weight stigma as a psychosocial contributor to obesity. *Am Psychol*. 2020; 75(2): 274.
13. Phelan SM, Burgess DJ, Yeazel MW, Hellerstedt WL, Griffin JM, van Ryn M. Impact of weight bias and stigma on quality of care and outcomes for patients with obesity. *Obes Rev*. 2015; 16(4): 319-26.
14. World Health Organization. Obesity and Overweight 2021. Available from: <https://www.who.int/en/news-room/fact-sheets/detail/obesity-and-overweight>. (accessed 28 February 2022).
15. Moyer VA. Screening for and management of obesity in adults: US Preventive Services Task Force recommendation statement. *Ann Intern Med*. 2012; 157(5): 373-8.
16. National Institute for Health and Care Excellence (NICE). Weight management: lifestyle services for overweight or obese adults. Public health guideline [PH53]: NICE; 2014. <https://www.nice.org.uk/guidance/ph53>. (accessed 20 Feb 2022).
17. National Health and Medical Research Council. *Clinical Practice Guidelines for the management of overweight and obesity in adults, adolescents and children in Australia 2013*. <https://www.nhmrc.gov.au/about-us/publications/clinical-practice-guidelines-management-overweight-and-obesity>. (accessed 20 May 2022).

18. Obesity Canada. Canadian Adult Obesity Clinical Practice Guidelines: Obesity Canada; 2022. <https://obesitycanada.ca/guidelines/chapters/>. (accessed 10 May 2022).
19. Ministry of Health. Clinical Guidelines for Weight Management in New Zealand Adults 2017. <https://www.health.govt.nz/publication/clinical-guidelines-weight-management-new-zealand-adults>. (accessed 19 May 2022).
20. National Institute for Health and Care Excellence. Obesity: identification, assessment and management Clinical guideline [CG189] London: NICE; 2014. <https://www.nice.org.uk/guidance/cg189/chapter/1-Recommendations#surgical-interventions>. (accessed 20 May 2022).
21. Bhurosy T, Jeewon R. Pitfalls of using body mass index (BMI) in assessment of obesity risk. *Curr Res Nutr Food Sci*. 2013;1(1):71-6.
22. Ministry of Health. Body size 2018. <https://www.health.govt.nz/our-work/populations/maori-health/tatau-kahukura-maori-health-statistics/nga-tauwehe-tupono-me-te-marumaru-risk-and-protective-factors/body-size>. (accessed 20 May 2022).
23. McLaughlin JC, Hamilton K, Kipping R. Epidemiology of adult overweight recording and management by UK GPs: a systematic review. *Br J Gen Pract*. 2017; 67(663): e676-e83.
24. Gudzone KA, Doshi RS, Mehta AK, Chaudhry ZW, Jacobs DK, Vakil RM, et al. Efficacy of commercial weight-loss programs: an updated systematic review. *Ann Intern Med*. 2015;162(7):501-12.
25. Laudenslager M, Chaudhry ZW, Rajagopal S, Clynes S, Gudzone KA. Commercial Weight Loss Programs in the Management of Obesity: an Update. *Curr Obes Rep*. 2021; 10(2): 90-9.
26. Auckland Weight Loss Surgery. Auckland Weight Loss Surgery specialises in the surgical management of obesity n.d. <https://aucklandweightlossurgery.co.nz/>. (accessed 01 December 2022).
27. Auckland Weight Loss Surgery. How much does a Gastric Sleeve or a Gastric Bypass cost ? n.d. <https://aucklandweightlossurgery.co.nz/what-does-it-cost/>. (accessed 01 December 2022).
28. Ministry of Health. Obesity Statistics 2021. <https://www.health.govt.nz/nz-health-statistics/health-statistics-and-data-sets/obesity-statistics>. (accessed 24 Jan 2022).
29. World Health Organization. Health inequities and their causes 2018. <https://www.who.int/news-room/facts-in-pictures/detail/health-inequities-and-their-causes>. (accessed 01 December 2022).
30. Hill A. Social and psychological factors in obesity. *Obes Sci Pract*. 2009: 347-66.
31. Fanslow J, Hashemi L, Gulliver P, McIntosh T. Adverse childhood experiences in New Zealand and subsequent victimization in adulthood: Findings from a population-based study. *Child Abuse Negl*. 2021;117:105067.
32. Swinburn B, Egger, G., and Raza, F. Dissecting obesogenic environments: the development and application of a framework for identifying and prioritizing environmental interventions for obesity. *Prev Med*. 1999; 29(6): 563-70.

33. World Health Organization. Social Determinants of Health: World Health Organization; 2022. https://www.who.int/health-topics/social-determinants-of-health#tab=tab_2. (accessed 20 May 2022).
34. Stranden E, Gundersen IF, Getz L, Kirkengen AL, Hagen KB, Mjølstad BP. Adverse life experiences among patients with morbid obesity. *Tidsskrift for Den norske legeförening*. 2020.
35. Norman K, Chepulis L, Burrows L, Lawrenson R. Adult obesity management in New Zealand general practice: a review. *J Prim Health Care*. 2021.
36. Graham R, Masters-Awatere B. Experiences of Māori of Aotearoa New Zealand's public health system: a systematic review of two decades of published qualitative research. *Aust N Z J Public Health*. 2020;44(3):193-200.
37. Doolan-Noble F, Pullon S, Dowell T, Fuller D, Love T. Men living with obesity in New Zealand: What does this mean for health care in general practice? *Obes Res Clin Pract*. 2019; 13(3): 233-9.
38. Russell N, Carryer J. Living large: the experiences of large-bodied women when accessing general practice services. *J Prim Health Care*. 2013;5(3):199-205.
39. Dean S, Elley C, Kerse N. Physical activity promotion in general practice: Patient attitudes. *Aust Fam Physician*. 2007; 36(12): 1061
40. Forrest R, Taylor L-A, Roberts J, Pearson M, Foxall D, Scott-Chapman S. Patu™: Fighting fit, fighting fat! The Hinu Wero approach. *AlterNative: An International Journal of Indigenous Peoples*. 2016; 12(3): 282-97.
41. Bell A, Swinburn B, Amosa H, Scragg RK. A nutrition and exercise intervention program for controlling weight in Samoan communities in New Zealand. *Int J Obes*. 2001; 25(6): 920-7.
42. NCD Risk Factor Collaboration. Rising rural body-mass index is the main driver of the global obesity epidemic in adults. *Nature*. 2019; 569(7755): 260.
43. Howard NJ, Hugo GJ, Taylor AW, Wilson DH. Our perception of weight: Socioeconomic and sociocultural explanations. *Obes Res Clin Pract*. 2008; 2(2): 125-31.
44. Haynes A, Kersbergen I, Sutin A, Daly M, Robinson E. A systematic review of the relationship between weight status perceptions and weight loss attempts, strategies, behaviours and outcomes. *Obes Rev*. 2018; 19(3): 347-63.
45. Johnson F, Beeken RJ, Croker H, Wardle J. Do weight perceptions among obese adults in Great Britain match clinical definitions? Analysis of cross-sectional surveys from 2007 and 2012. *BMJ Open*. 2014; 4(11).
46. Ministry of Health. Measuring Weight 2018. <https://www.health.govt.nz/your-health/healthy-living/food-activity-and-sleep/healthy-weight/measuring-weight>. (accessed 15 Feb 2022).
47. Ministry of Health. Measuring Weight 2018. <https://www.health.govt.nz/your-health/healthy-living/food-activity-and-sleep/healthy-weight/measuring-weight>. (accessed 15 Feb 2022).
48. Davis-Wheaton J. Breaking down health barriers in rural areas. *Kai Tiaki: Nursing New Zealand*. 2013; 19(2): 2.

49. Braun V, Clarke V. Successful qualitative research: A practical guide for beginners. London, England: Sage; 2013.
50. Braun V, Clarke V. To saturate or not to saturate? Questioning data saturation as a useful concept for thematic analysis and sample-size rationales. *Qual Res Sport Exerc Health*. 2021; 13(2): 201-16
51. Allen JT, Cohn SR, Ahern AL. Experiences of a commercial weight-loss programme after primary care referral: A qualitative study. *Br J Gen Pract*. 2015; 65(633): e248-e55.
52. Epstein L, Ogden J. A qualitative study of GPs' views of treating obesity. *Br J Gen Pract*. 2005; 55(519): 750-4.
53. Glenister KM, Malatzky CA, Wright J. Barriers to effective conversations regarding overweight and obesity in regional Victoria. *Aust Fam Physician*. 2017; 46(10): 769.
54. Claridge R, Gray L, Stubbe M, Macdonald L, Tester R, Dowell AC. General practitioner opinion of weight management interventions in New Zealand. *J Prim Health Care*. 2014; 6(3): 212-220.
55. Couch D, Thomas SL, Lewis S, Blood RW, Holland K, Komesaroff P. Obese people's perceptions of the thin ideal. *Soc Sci Med*. 2016; 148: 60-70.
56. Folkvord F. *The Psychology of Food Marketing and (Over)eating*. London, England: Routledge; 2019.
57. Ananthakumar T, Jones NR, Hinton L, Aveyard P. Clinical encounters about obesity: Systematic review of patients' perspectives. *Clin Obes*. 2020; 10(1): e12347.
58. Starfield B. Primary care: an increasingly important contributor to effectiveness, equity, and efficiency of health services. *SESPAS report 2012*. *Gaceta sanitaria*. 2012;26:20-6.

Chapter 10: Discussion

This research thesis has explored obesity healthcare in rural NZ general practice using a sequential, explanatory mixed method research design. Each of the publications offer their own discussion and implications for practice and therefore will not be repeated in this chapter. Instead, this chapter offers a discussion of the key barriers identified within and outside the scope of general practice, highlights the research improvement areas and intervention approach opportunities that could be useful to reduce barriers experienced, details implications of this research, identifies future directions for obesity research, and provides a final conclusion.

Summary of Findings

This research aimed to explore the barriers within one sector of obesity healthcare: the individual focused area of general practice. While the other sectors are equally as important to effective obesity management throughout NZ (including the population health level initiatives, and the more specialist avenues that deliver care for obesity related multi-morbidity health issues), this thesis addressed the barriers for general practice with obesity management. Acknowledging that obesity is a complex and interconnected matter, this thesis also focuses on the rural general practice context as this has received little attention in previous NZ literature. This thesis research discusses the barriers to, and experiences with, obesity management in rural general practice from the perspectives of those working in, and accessing, general practice: clinicians and clients.

The experiences of both clinicians and clients were complex and nuanced, with each participant having a unique experience with obesity management (as highlighted in chapters 5-9). Clinicians detailed how 'managing' obesity health concerns in their role differed with each client, as no two clients were experiencing obesity in the same manner. In addition, each of the rural general practices had their own unique geographical locality barriers, as well as unique sociocultural community norms. Each of the clinicians had different backgrounds, worldviews, personal experiences, and some compared perceived barriers with those observed in their previous employment in more affluent urban general practices. Clients expressed a range of experiences living with, or managing, their obesity. Some clients described themselves as having had 'success' at effectively managing their weight, whilst some regarded themselves as being at the beginning of their weight management journey. Still, others perceived themselves as being 'stuck' or remaining in the 'ineffective' weight management 'cycle'. In addition, each client had an individualised combination of social determinants of health which influenced their perceptions and experiences with weight management and its barriers. In other words, each participant's narrative was nuanced, complex and interconnected with other aspects of their health, and indeed, their lives.

Obesity is a complex and multi-factorial health issue (World Health Organization, 2021a) and this research thesis identified many barriers to obesity management from clinician and client perspectives, as highlighted in all publications (chapters 3-9). However, when looking at these studies in their entirety, this research found that there were similar barriers perceived within each sample group. In addition, despite the different worldviews and experiences, this research, interestingly, identified some overlap in barriers between these two sample groups. These barriers were positioned both within and outside the scope of general practice, or external to the clinician/client interaction. Barriers within the scope of general practice were effective yet inaccessible weight management interventions, public health system interventions not being comprehensive, conflicting current nutritional guidelines, lack of rural general practice systemic

support, time consuming nature of obesity ‘treatment’, role of a clinician with obesity management, and the stigma or power imbalance barrier to discussing/ ‘treating’ obesity. Barriers outside general practice included, social determinants of health, obesogenic environment, privatised weight management programmes, and sociocultural norms. These barriers are discussed in more detail below.

Key Outcomes: Barriers Within General Practice

Effective Yet Inaccessible Weight Management Interventions

Health NZ offers weight management interventions through general practice which are set out in the clinical weight management guidelines (Ministry of Health, 2017). The first review manuscript identified these interventions as ‘effective’ as they achieved weight loss results with clients (as highlighted in table 2 in chapter 3). From this perspective, there are effective interventions available through general practice for clients to use. However, clinicians and clients (chapters 6-9) expressed that whilst these interventions are technically ‘available’ through their general practice, they are largely inaccessible to many rural clients, and therefore were perceived as ‘ineffective’. This ‘inaccessibility’ was linked to a lack of financial ability to afford weight management programmes, medication, bariatric surgery, or ‘healthy’ food at their local store (as highlighted by clinicians and clients in chapters 5-9). Rural geographical locality also meant that many participants had little or no access to a local supermarket, exercise facilities, or local weight management support meetings and had to travel to the nearest larger town for these. However, this travel was also subject to financial ability, as participants often lived in rural localities where there were no low-cost public transport options to get to a larger town. In addition, many participants could not afford private transport such as a car, meaning they could not physically or financially access the technically ‘available’ weight management intervention options.

The ‘effective’ weight management interventions offered through general practice (as highlighted in chapter 3) are for all general practices across NZ, including both urban and rural areas (Ministry of Health, 2017). Rural areas are reported to have access barriers to healthcare and experience more inequity than urban areas, including lack of public transport options, lack of employment opportunities, or lack of weight management options available locally (Davis-Wheaton, 2013; National Health Committee, 2010; Rural Health Alliance Aotearoa New Zealand, 2019). It is possible that the weight management interventions available through general practice are better suited for urban practices where they can be more easily accessed by clients, and therefore can be considered ‘effective’ and available. However, the findings from this research indicates that there is potentially a lack of attention on specific rural ‘accessibility’ needs when it comes to obesity healthcare. The perspectives of these clinicians and clients offer support for these previous findings and extend the potential for rural healthcare oversight to weight management in general practice. With many barriers identified for accessing and delivering obesity healthcare within these contexts, this issue of access is one that could be addressed for improving health outcomes. Potentially, having healthcare professionals located in rural general practices or local community contexts so clients do not have to travel large distances, could reduce the ‘inaccessibility’ experienced by these clients.

General Practice Interventions Not Comprehensive

The efficacy of the available interventions in general practice was found to be potentially hindered by the design of the interventions themselves. As highlighted in chapter 3, Health NZ and the WHO (World Health Organization, 2021a) the most effective weight management strategy is one that includes a combination of dietary manipulation, exercise engagement, and behavioural changes

actioned in culturally appropriate ways. Yet, none of the interventions available through general practice include all four of these elements in their design (table 2 chapter 3). In addition, many of the interventions that were piloted in general practice (chapter 3 and 4) measured 'efficacy' in the short term. This is reflected in the available NZ literature, whereby most of the evidence on weight management in primary care is from short term programs, with less information on the medium and long term impact or negative impacts of 'weight regain'. Further investigation into what constitutes an 'effective' weight management program in primary care is warranted, specifically in relation to the mid and long term health improvements for clients.

The need for comprehensive obesity healthcare was evident from both clinician (chapters 5-7) and client perspectives (chapters 8 and 9). Clients expressed a need for 'holistic' obesity healthcare that could address a range of factors related to their health, including psychological, emotional, physiological, financial, environmental, spiritual, and cultural (chapter 8 and 9). Clinician's views paralleled this with an acknowledgement that there are a multitude of factors impacting their clients dealing with weight management. Clinicians expressed that a comprehensive obesity care plan was needed for the majority of their clients which included options to address a client's underlying issues that contributed to their weight (such as trauma or life stressors) (chapters 5-7). In addition, clinicians (chapters 6 and 7) highlighted that there was a lack of culturally appropriate elements included in available interventions, especially for their indigenous Māori clients. Previous literature has stressed that utilising culturally appropriate worldviews, especially for indigenous populations, can significantly improve health (Durie, 2003; Ministry of Health, 2015; Te Morenga et al., 2018), yet minimal interventions included this element (table 2 chapter 3). Despite the aligned views of clinicians, clients, Health NZ and international WHO that the wider determinants of health impact the efficacy of weight management, there is still the barrier of a lack of 'holistic' or comprehensive multi-layered obesity healthcare options available to clients, or for clinicians to offer their clients, in NZ general practice. With the contributors to obesity understood to be complex, multileveled, and individualised, it is surprising that no intervention available within general practice meets all of these obesity healthcare needs. Without any comprehensive interventions for clinicians to refer their clients to, systemic concerns and questions about how clinicians are even supposed to deliver effective obesity healthcare in their practice remain. If obesity health outcomes are to improve, as has been the aim for the past 30 years, an effective, comprehensive weight management intervention is crucial.

Conflicting Current Nutritional Guidelines

The NZ health system provides evidence-based nutritional guidelines (CWMG) for clinicians to use when offering health advice to their clients for a range of issues, including weight management (Ministry of Health, 2017). Clinicians positioned these nutritional guidelines available for them to refer to as confusing, conflicting, and contradictory (chapters 6 and 7). It is recognised that dietary needs are different for each individual and can vary in relation to a multitude of factors including ethnicity, age, gender, employment type, lifestyle, or medical conditions (Ministry of Health, 2017, 2020), making the concept of a 'standardised' nutritional guidelines a complicated and even questionable task. However, these nutritional guidelines are blanket guidelines for all general practice across NZ, and are not tailored for the rural culture which can experience difficulties in access to affordable healthy food for a healthy lifestyle (National Health Committee, 2010; Rural Health Alliance Aotearoa New Zealand, 2019). These nutritional guidelines are also not tailored for the indigenous food practices in rural areas and were considered not useful for clinicians to offer their rural or indigenous clients. While there is a plethora of nutritional information available, any

advice given in rural general practice would benefit from being suitable and relevant to the rural sociocultural norms if they are to have maximum efficacy.

GP's (in chapter 6) specifically highlighted how the nutritional guidelines orientate around specific 'disease' needs and can be difficult to navigate if their client has more than one health issue affecting their quality of life. Obesity, if left unchecked, can lead to further comorbidities (such as type 2 diabetes, heart disease, and depression) (Ministry of Health, 2022b) and when nutritional guidelines contradict each other, both the clinician and client experience confusion around the best way to improve health outcomes (as highlighted in chapters 6-9). This indicates that there are some 'holistic' dietary needs (which encompass a client's multiple health issues) that are potentially not being met, which could benefit from being addressed to ease confusion and improve health outcomes for these clients. Notably, the role of a dietitian is a referral option for these types of complex nutritional needs in general practice (Ministry of Health, 2017), and the value of dietitians working in primary care as part of a multi-disciplinary team within obesity healthcare in NZ has recently been identified (Beckingsale et al., 2016; Howatson et al., 2015). However, clinicians in this research stressed how access to dietitians is limited rurally when compared with urban practices. Having dietitians based in rural general practice could ease this access barrier for clients and enable clinicians to have to an effective form of care they could guide their clients to for help. However, dietitians based in rural contexts would also need to offer non-conflicting dietary advice that was suitable for their clients living in rural culture, as well as provide dietary healthcare that was tailored for indigenous culture living rurally if health outcomes are to improve.

With the lack of dietitian or other health practitioners based 'in-house' in rural practices and conflicting nutritional guidelines (non-rurally specific) to work with, clinicians expressed the challenging nature of attempting to offer rurally relevant weight management advice. The participants in this research identified there to be a complex nutrition environment in which they work in, with diverse potential sources of knowledge (such as internet, fad diets, 'quick fix' commercial companies, and word of mouth). To overcome these challenges, clinicians attempted to offer 'practical' advice to clients that minimised confusion, was individually tailored, and could be within financial reach of many of their rural clients. This advice included behaviours such as switching from dark-blue-top milk to a lower fat content light-blue-top milk, or removing sugary drinks (like Coca-Cola) from the home (chapter 7). In addition, clinicians offered advice for other elements of effective weight management, including exercise options that were more accessible for their rural clients, such as housework activities or walks for daily exercise instead of attending an exercise facility (if there even was one locally). However, clinicians also noted that they were reliant on their own sense of what might work in any given case, depended on their own personal experiences and were aware that this could differ between them all as clinicians and cause further confusion for clients (chapter 7). Essentially, despite the clinician's efforts to offer their client non-conflicting advice from the national nutrition guidelines, confusion still reigns supreme across the client's weight management experiences in general practice. This was confirmed by clients (highlighted in chapters 8 and 9) that they received inconsistent information from their healthcare professionals, which left them unsure of who to turn to for 'trustworthy' or 'factual' nutritional advice for weight management. Potentially, having qualified professionals, such as a dietitian, based in-house at a rural general practice, could assist with reducing this confusion for clients and improve their weight management experiences and health outcomes.

Lack of Rural General Practice Systemic Support

Clinicians (chapter 6 and 7) expressed that rural general practice received minimal systemic support from the public health system, including obesity healthcare, which was perceived to act as a barrier

to effective weight management. Clinicians (chapter 6 and 7) reported issues including lack of rural health funding, lack of rural staff (such as sharing nurses with neighbouring towns), lack of local resources or facilities, locality isolation or restrictive lifestyle (no internet signal in some areas) and a lack of culturally appropriate resources (rural culture or indigenous culture), which all impacted the efficacy of obesity reducing strategies in their rural practices. Clinicians (chapter 6 and 7) expressed that the very health system they work for is not fully aware of the limitations of rural health, rural working conditions, or rural needs, at any government level. Instead, clinicians (chapter 6 and 7) claimed that they are unable to fully rely on certain aspects of their own health system for obesity management. Clients' views aligned with clinicians whereby they perceived that rural health was not appropriately catered for, with a lack of understanding about the difficulties in accessing healthcare due to the necessity to travel, or the financial and time costs associated with attending healthcare (chapter 8 and 9). Rural health has been identified to experience many barriers in previous international weight management literature, including access and locality limitations, lower amounts of facilities or commercial weight management choices (Alsop-ten Hove, 2019; Davis-Wheaton, 2013; National Health Committee, 2010; Rural Health Alliance Aotearoa New Zealand, 2019). However, if rural general practice is expected to deliver quality weight management healthcare, then strong systemic foundations with relevant and rurally appropriate support for clinicians are key. Increasing the amount of rurally based staff, and providing adequate training around the unique rural health culture for those working in these rural spaces, could be beneficial for rural support and improving health outcomes.

Time Consuming Nature of Obesity 'Treatment'

The complex and individualised nature of obesity makes its management complicated in the short time frame of a general practitioner consult. Unlike some other health issues treated in general practice that have an evidence-based agreed upon 'best treatment' (for example prescribing antibiotics for treating an infection (BPACnz, 2021)), obesity has a range of 'treatment' approaches. Clinicians (chapter 6 and 7) and clients (chapter 8 and 9) highlight that achieving successful weight management was more complicated than just the physiological aspect of a 'calorie manipulation' or deficit. While both clinicians and clients acknowledged that a calorie manipulation is a non-negotiable element required for effective weight management, there was also a shared understanding that each client experiences different barriers when attempting to achieve or maintain a calorie deficit plan (of any kind), which is where many difficulties in 'treating' obesity originate from. Identifying, understanding, or treating these underlying, personalised barriers was recognised as vital for successful weight management. However, to do so takes significant amounts of time and a strong therapeutic relationship with the client (chapter 6 and 7). Unfortunately, this crucial element of time is a factor that a general practice model is not equipped to offer with only 10-15 minute GP consultations. Nurses can sometimes afford longer with their clients, however, other healthcare needs and expectations of tasks within that time frame is also strained (chapter 7). Nurses also reported that their time frame is still not long enough to develop a strong therapeutic relationship that is often needed for effective obesity management (chapter 7). The time-consuming nature of comprehensive obesity healthcare raises concerns about a general practice clinician's physical capacity to deliver this healthcare effectively in their role. Perhaps, introducing a health professional with available time (and appropriate training on the complexities and nuances of rural obesity and its management) situated within the rural practice could assist with reducing this reported 'lack of time' barrier experienced and enable strong therapeutic relationships with clients to be developed.

Role of a Clinician with Obesity Management

Despite the complex individualised nature of obesity, and the positioning of general practice clinicians as suitable for delivering obesity healthcare, clinicians and clients questioned the extent of a clinician's involvement with a client's weight management endeavours. GP's (chapter 5 and 6) suggested that certain aspects of a client's weight management needs were outside the scope of their practice, and instead, required care along social services or professional psychologist avenues (for underlying trauma or social determinant factors influencing effective weight management strategies). Nurses (chapter 7) also stressed that their role became significantly multi-faceted when delivering obesity healthcare. These 'roles' extended beyond the mainstream responsibilities of a clinical nurse and overlapped with responsibilities found in roles such as a health coach, counsellor, motivational speaker, social worker, public health educator, facilitator, or social support person (as detailed in chapter 7). However, GP's are by definition 'generalists', not specialists, and nurses, despite having an invaluable skill repertoire, are not qualified psychologists, counsellors, or educators. The role of a clinician in obesity management has been identified as unclear in prior studies, with systemic responsibilities conflicting with practical demands of the role in many cases (Bell et al., 2018; Carryer et al., 2011; Epstein & Ogden, 2005; Nolan et al., 2012). This research offers some support for these previous studies, however, extends this to the NZ rural sector as well. The role of a general practice clinician is valuable as they can act as a great support or 'health guide' for their clients, having strong relationships with their clients, and advising them of best options to improve their health concerns. However, as highlighted by both clinicians and clients in this research (chapters 6-9) there is little 'effective', accessible, indigenous, or rurally appropriate interventions or health professionals to guide their clients to.

The limited effective weight management options for rural general practice to refer their clients to was reported to threaten to jeopardize the strength of the crucial clinician/client relationship. Clients reported (chapter 8 and 9) that their obesity-related health needs were 'holistic' or multi-layered, and reportedly not addressed in their general practice clinician interactions. Clinicians, in turn, discerned a lack of accessibility to obesity intervention options (chapter 6 and 7) meaning they had little to offer their clients that could address whole-person healthcare. With their healthcare needs perceived as 'unmet' some clients questioned whether a clinician was an obesity 'expert' who could even help them in any meaningful way (chapter 9), potentially hindering the quality of the relationship. This suggests that the role of a general practice clinician becomes even more difficult, whereby without effective healthcare to guide their clients to, clients question the point of seeking this healthcare from their clinician. This was expressed in chapter 9 where some clients highlighted that they would not go to their GP for this help. This raises questions about the suitability of the general practice clinicians tasked with the responsibility to provide obesity healthcare to a group who potentially do not even seek said healthcare from them in the first place. Potentially, having rurally appropriate avenues (interventions or health professionals to refer to) for clinicians to guide their clients to could help to reduce the risk of damaging the therapeutic relationship, which is considered vital for improving health outcomes by GP's and nurse's (chapter 6 and 7).

Previous literature has indicated that there are mixed views about the role a clinician should play in a client's weight management. Some clinicians did believe it was their responsibility to address obesity in their practice (Buffart et al., 2008; Campbell et al., 2000), yet highlighted the complications to do this in their role for a unique and self-manageable health risk (Claridge et al., 2014; Epstein & Ogden, 2005; Glenister et al., 2017). Some clinicians put the responsibility of weight management onto the client, were not convinced obesity is a medical problem or that is part of the scope of general practice, believe clinicians should play a passive role in weight management, or that clients lack motivation for change (Epstein & Ogden, 2005; Ogden et al., 2001; Sonntag et al., 2012; Teixeira et al., 2015). However, other research has indicated that positioning the client as solely

responsible for 'failing' to manage their weight is stigmatising and victimising which can further perpetuate the obesity cycle and weight gain (Brewis, 2014; Puhl et al., 2020; Tomiyama et al., 2018). While clinicians in this research (chapters 6 and 7) acknowledged that obesity needs to be discussed and attended to within general practice due to its connection to other 'clinical' health issues, clinicians also stressed that discussing obesity and delivering the actual obesity healthcare themselves was difficult, supporting previous literature (Blackburn et al., 2015; Glenister et al., 2017; Michie, 2007). Clinicians reported (chapters 4 and 6) feeling ill-equipped to provide effective obesity healthcare and that discussions were delicate endeavours due to the stigmatised nature of obesity outside the scope of general practice. Reflecting on these barriers expressed from a wider perspective, this is understandable as there is minimal attention given to obesity management in medical schools (Butsch et al., 2020; Forman-Hoffman et al., 2006; Mastrocola et al., 2020). This raises further concerns around the efficacy of a general practice clinician in a weight management role when the education system does not provide a curriculum that attends to the stigmatised and individualised issues with obesity healthcare. Perhaps, the role of a general practice clinician could be better utilised in a support role to a wider multi-disciplinary health team (that includes roles such as counsellor, psychologist, social support workers, indigenous health professionals, dietitians) who have adequate tertiary training with a working knowledge of effective obesity management.

Stigma and Power Imbalance Barrier to Discussing/ 'Treating' Obesity

Discussing, assessing, and managing obesity was expressed by clinicians as difficult to achieve due to perceived stigma and power imbalances in the therapeutic relationship with their clients. Obesity is a stigmatised phenomenon both within and outside general practice in many cultures (Brewis, 2014; Lewis et al., 2011; Puhl & Heuer, 2010). Previous research has indicated that some clients have experienced weight related stigma in their primary care interactions (Lee & Pausé, 2016; Russell & Carryer, 2013). Some clinicians have identified that they are aware of the potential for stigma and attempt to actively avoid it in their practice, however, this was positioned as difficult due to the range of subjective perspectives obesity can embody (Glenister et al., 2017; Gray et al., 2018; Michie, 2007). The clinicians in this research were aware of obesity stigma which impacted the ability to raise, discuss and treat obesity within their practice (chapters 3, 4, 6 and 7). Health messages are inevitably shaped by those delivering them and messages about obesity are no exception. Previous literature has identified that the perceived weight of a clinician can impact how health messages are received, where one study found that clients with obesity generally 'trusted' the weight management advice from a clinician who was overweight as opposed to a 'normal' weight (Bleich et al., 2013). However, another study indicated that a clinician's perceived excess weight could negatively affect clients' perception of the clinician's credibility, level of trust, or impact the likelihood of following the clinician's weight management advice (Puhl et al., 2013). These are based on perceptions, which can vary widely when it comes to obesity (Bell et al., 2017; Brewis, 2010; Howard et al., 2008). Yet, the perceptions of a clinician's weight when delivering weight management messages can potentially damage the therapeutic relationship with the client. In addition, concepts such as ethnicity and socioeconomic status differences between a clinician and client can contribute to a power imbalance in the therapeutic relationship, which is a complicated space to navigate (Goodyear-Smith & Buetow, 2001). The clinicians in this research were aware of the potential for power imbalances within their therapeutic relationships (such as being from a higher income, 'healthy weight', or sometimes non-ethnic minority background than their clients) and reported actively trying to avoid this imbalance or stigma with their clients (chapter 6 and 7). Any risk of jeopardizing the therapeutic relationship was positioned as detrimental to the client's long-term health (chapter 6 and 7), and was actively avoided by these clinicians, which has been noted in previous literature (Blackburn et al., 2015; Epstein & Ogden, 2005; Glenister et al., 2017).

Avoiding obesity stigma is difficult due to the subjective and socially determined nature of 'obesity'. However, actions in other sectors of obesity healthcare could potentially assist with reducing stigma through population health or public health campaigns. These avenues are outside the scope of this thesis research context of general practice and are not discussed in detail here.

Key Outcomes: Barriers Outside General Practice

As chapter 4 highlights, not only were there significant barriers within the context of general practice, significant barriers were identified outside the scope of general practice that influenced the efficacy of weight management within general practice. Obesity is not only a clinical health concern, but also a public health concern, and factors outside the control of a general practice clinician were found to impact obesity management efforts by clinicians. These factors are outside the current scope of general practice and the scope of this research thesis, however, health, and therefore barriers to health, cannot be viewed in an isolated manner (World Health Organization, 2022). Whilst some of the factors outside the scope of general practice are situated in different obesity management sectors (such as population/ public health and more specialist secondary care), some factors do overlap with this research thesis' context of general practice. These overlapping factors are included in this research thesis discussion, as the participants indicated that they are significant to their weight management experiences in general practice, and are therefore relevant to this research findings and conclusions. The factors outside the scope of general practice highlighted by participants include social determinants of health, the obesogenic environment, the privatised weight management industry in society, and the sociocultural norms in which participants lived in. Whilst these are detailed in chapters 6-9, an overview is discussed below.

Social Determinants of Health

Obesity is influenced by many factors, with social determinants of health identified as a significant influencer by both clinicians and clients (chapters 6-9) supporting the WHO view of health (World Health Organization, 2022). Social determinants of health shape all engagement with healthcare services, however, there is less resources and different social determinants that are dealt with in rural settings (Alsop-ten Hove, 2019; National Health Committee, 2010; Rural Health Alliance Aotearoa New Zealand, 2019). Clinicians understood that their clients' financial situation, education levels and sociocultural groups they belong to (and the norms that go along with those groups) impacted the ability to find a suitable weight management option that could be achievable within the limitations of their rural lifestyle (chapter 6 and 7). Clients were aware that their environment, income, lack of access to healthy affordable food, and the rural locality in which they reside in, all influenced the efficacy of their weight management strategies or obesity related behaviours (chapter 8 and 9). Both clinicians' and clients' views were aligned and understood that social determinants of health could be problematic and act as a barrier to effective weight management in rural settings, supporting previous literature (Alsop-ten Hove, 2019; National Health Committee, 2010; Rural Health Alliance Aotearoa New Zealand, 2019; Sapaugh, 2018; World Health Organization, 2022). These social determinants of health further impact the efficacy of any weight management intervention, make the role of a clinician to help their client more difficult, and has significant impact on the overall quality of life for an individual. Acknowledging and including rural social determinants of health into obesity healthcare could be useful to develop flexible, tailored, and comprehensive interventions and increase efficacy potential.

Obesogenic Environment

Both clinicians' and clients' perspectives aligned with the barrier of obesogenic environments that influenced the efficacy of any weight management efforts (chapter 5-9). The rural towns in this research were perceived to have high rates of 'unhealthy' food outlets (such as bakeries or fast-food take-aways) which were cheap and affordable options for low-income households. A lack of commercial competition meant that competitive pricing was minimal whereby in some cases, there was only one local grocery store or mini-supermarket and little (or no) functioning exercise facilities locally (chapter 6 and 7), further limiting the options available for clients. Previous literature has identified how low-income communities can be ranked high for obesity promoting environments (Swinburn, 1999) as well as subject to the consequences of purposeful tactics used by large companies to influence public policy and opinion to their favour of unhealthy food promotion (Sacks et al., 2018). Whilst the rural areas in which practices and participants resided varied, the majority had a high-density of obesity-promoting food establishments and/or minimal fresh-food options that were affordable. The obesogenic environment and wider political influences make the role of a clinician even harder, because the general practice 'healthy lifestyle' advice is challenging to follow in the heavily advertised 'cheap' and 'easy' food environment that their clients exist in. This indicates that any future weight management strategies offered within general practice could look to include education around how to navigate these obesogenic environments to increase the chances of successful obesity management for clients and improving health outcomes.

Privatised Weight Management Programmes

Obesity, whilst considered a clinical health issue in general practice, can be 'treated' outside the general practice context. This is seen through clients' own self-designed calorie deficit strategies, or through commercial weight management companies (Les Mills, 2022; Weight Watchers, 2022). However, the efficacy of these options for primary care clients is questionable as they are not regulated by the same evidence-based bodies used for general practice (Gudzune et al., 2015; Laudenslager et al., 2021). This research does not investigate the efficacy of, or wider socio-ethical issues and debates with the 'diet industry' phenomenon (Bødker et al., 2015; Fleck, 2003; Mandle et al., 2015; Mello et al., 2003; Ogden et al., 1992; Sacks et al., 2018) which are extensive. However, these programmes are factors influencing the experiences with weight management for clients and clinicians in this research and are therefore contextually acknowledged. Health systems in the UK and Australia have explored referral options to some of the more 'mainstream' commercial companies (Ahern et al., 2011; Allen et al., 2015; N. R. Fuller et al., 2014; Jebb et al., 2011). However, as previously indicated, these are primarily accessible options for more urban areas, with little or no rural communities able to access 'local' commercial programme meetings weekly, or have limited internet access to 'attend' remotely for example.

This research thesis found that while some clinicians highlighted that commercial programmes can be effective, they were viewed with scepticism, as the 'efficacy' was on a case-by-case basis and depended on other individual factors, such as health literacy, financial ability to attend the programmes (as usually out of town) and psychosocial factors of the client (chapter 6 and 7). Clients in this research thesis were aware of these commercial companies, however, they were viewed with suspicion. Clients (chapters 8 and 9) indicated that while companies advertised a 'product' (weight loss) that technically would be effective (a calorie deficit programme), these were situated within a business model that was structured to make a profit from the obesity health issue. In many cases, weight management was not achieved (or maintained long-term) which left the clients questioning who the 'trust-worthy' weight management 'professionals' or 'experts' actually were (chapters 8 and 9). Clients reportedly experienced concepts of confusion, tension and frustration as to the 'best way' to manage their weight, as these nutritional messages from commercial programmes differed,

sometimes significantly, and were viewed as contradictory (chapter 8 and 9). Whilst this research does not explore the experiences with commercial weight management options, there was notably, a significant lack of discourse around any weight management plan that was tailored to the rural culture or indigenous culture, indicating another potential barrier for rural communities wanting to access commercial options.

Sociocultural Norms

This research thesis identified that sociocultural ‘norms’ were a significant barrier to weight management and often located outside the scope of general practice. Clinicians were aware that some of the cultural, or rural social norms dictated the social customs (chapter 6 and 7) of the communities their clients lived in. Rurally, community involvement was found to be crucial to rural lifestyle. Clients reported that ‘offending’ someone by refusing their food, or not eating everything on their plate, was seen to be a social custom or behaviour that was detrimental to maintaining social connections (chapter 8 and 9). However, this meant that any calorie deficit or manipulation programmes that clients may be attempting were potentially jeopardised. For some clients (chapter 8 and 9), risking damage to a social connection or cultural connection was to be avoided and this trumped weight management requirements, acting as a further barrier to effective obesity management. This research indicated that some of the ‘norms’ clients identified with, were counter-productive to weight management efforts, making it more challenging for clinicians to help clients improve their health outcomes. This finding indicates that any interventions or nutritional advice developed for rural general practice use, would benefit from including factors that enable clients to maintain their cultural and social connections that are significant to their rural sociocultural norms, including indigenous cultural norms.

The normalisation of obesity has been identified in previous literature to potentially hinder the obesity healthcare efforts of clinicians in general practice (Johnson et al., 2014; Patterson & Hilton, 2013). Clinicians (chapter 6) and clients (chapter 8) perceived rural areas to be more accommodating of obesity whereby it was positioned as ‘okay’ or ‘normal’ to be obese in rural towns. Previous literature has indicated that cultural norms can shape the way in which obesity is perceived (Ball, 2010; Bell et al., 2017; Brewis, 2010) which this research found support for from both client and clinician experiences. However, this normalisation of obesity in rural areas could potentially be acting as a barrier, which makes the role of a clinician challenging because what is seen as ‘normal’ outside general practice, is considered a significant health risk within general practice. The differences in these ‘norm’ perspectives can make discussion and assessing ‘obesity’ complicated within the general practice context (Johnson et al., 2014). However, if obesity related health outcomes are to improve, then any efforts would benefit from being positioned in a way that both clinicians and clients benefit. Notably, public health campaigns could be an ideal area for increasing obesity health awareness about obesity ‘norms’, however, this is not the area of focus of this research thesis and is not detailed here. At a general practice level, any interventions developed in the future should potentially include aims to reduce the comorbidity risk factors of obesity (such as diabetes, heart disease, stroke) rather than weight in isolation, which could align better with a rural cultural obesity ‘norm’ perspective.

Addressing Barriers: Intervention Approach Opportunities

Effective Weight Management Intervention Development

Developing a weight management intervention that is considered ‘effective’ for rural general practice clinicians and clients would be useful for improving obesity health outcomes. This research

found that an effective intervention is one that is accessible and available for rural clinicians to offer their clients within general practice and that suits rural sociocultural norms and culture, including indigenous culture. Intervention options would be more effective if they include components that are rurally feasible, practical, financially achievable, and work within the limitations of clients' rural lifestyles (such as social determinants of health limitations or areas with little, or no, exercise facilities or affordable transport options). These interventions would benefit from including a multi-pronged approach to maximise efficacy (as advised by the WHO and Health NZ) which includes all significant elements to weight management such as dietary changes, exercise engagement, behavioural changes and tailored to be culturally appropriate (Ministry of Health, 2017; Norman et al., 2021). Learning from past weight management strategies and building upon these interventions further could assist with avoiding past mistakes. For example, some culturally-specific interventions might maximise efficacy by being situated within culturally appropriate environments and principles, such as with Māori health providers on Marae or in other places of cultural congregation (Bell et al., 2001; Forrest et al., 2016; Harding et al., 2021) in NZ. Additionally, drawing on previous rural interventions and working with each unique community (Coghlan, 2014; Harding et al., 2021) to avoid the known rural health inequities (Alsop-ten Hove, 2019; Crawford et al., 1998; National Health Committee, 2010; Rural Health Alliance Aotearoa New Zealand, 2019; Sapaugh, 2018), could also be useful and may yield positive results. With the health system changes currently happening in NZ (New Zealand Government, 2022), there is an opportunity for a new way of addressing obesity healthcare and potentially, the development of integrated localities allows better integration between general practice and other primary care practices working within rural communities and the obesity healthcare space.

Clinician Obesity Education Intervention

Obesity has become a significant health issue in itself, yet previous literature has highlighted that obesity education in medical school curriculum is given little attention (Butsch et al., 2020; Forman-Hoffman et al., 2006; Mastrocola et al., 2020). Both GP's (chapter 6) and nurse's (chapter 7) in this research thesis expressed the difficulties in 'treating' a health issue that affects each client differently. Some clinicians highlighted that even raising the topic was difficult which supports previous findings (Glenister et al., 2017; Gray et al., 2018). Intervening in this space, and better equipping the healthcare workforce could assist with reducing some of the difficulties clinicians expressed in this research thesis. Teaching obesity related healthcare in medical programmes has been called for recently and suggested to be beneficial, including not only the biological markers, but also the socioenvironmental determinants of weight and the ways in which stigma can act as a contributor to obesity as well (Butsch et al., 2020; Talumaa et al., 2022).

Reclaiming Obesity Discourse Intervention

Clinicians in this research thesis expressed that raising and discussing obesity in their consultations was difficult because of the perceived stigma associated with obesity and a desire to not risk jeopardising their vital therapeutic relationship with their client (chapter 6 and 7). Many clients (chapter 4, 8 and 9) perceived obesity stigma and discrimination to be present in their general practice interactions which damaged the relationship with their clinician, or became a barrier to seeking future healthcare. Intervening in this context by disassociating 'obesity' with perceived stigma and discrimination, at least within the general practice environment, could assist with minimising potential damage to the therapeutic relationship. Significant arguments highlight that obesity is not directly correlated to 'health' (Bacon, 2010; Campos, 2004) and body size is not considered a negative health issue from different cultural perspectives (Ball, 2010; Bell et al., 2017; Brewis, 2010; Ulijaszek & Lofink, 2006). Whilst this research does not address these debates, these

views are important to acknowledge as they impact the way in which obesity is defined, discussed, experienced and 'treated' both within and outside of general practice, and is contextually relevant to these findings. In this case, re-framing the discourse around 'obesity', at least in the general practice context, towards a clinical 'health-risk' association, could potentially ease the difficulties of raising obesity health discussions experienced by these clinicians and reduce the perceived stigma and discrimination experienced by clients. Aligning obesity discussions with 'health' and not forms of social judgement, could potentially lead to reducing negative experiences for clients that discourage them from returning to seek healthcare or damaging the therapeutic relationship.

Population Health Overlap

The participants in this research thesis highlighted that education and obesogenic environments were relevant to their weight management experiences and warrant attention. Whilst the focus of this research thesis is not on population obesity health, these elements were expressed as significant to the experiences with weight management in general practice by these clients and clinicians and are therefore included in this section. This research does not offer any public health recommendations as this was not the aim of this research thesis, however, elements of overlap are notable for this discussion. In the last 50 years, the food climate has dramatically changed in NZ, with obesity-promoting environments present in many urban and rural areas (Carter & Swinburn, 2004; Lake & Townshend, 2006; Swinburn, 1999). Clinicians (chapters 6 and 7) described the obesogenic environments their clients lived in to have negative influences on their clients' weight management efforts. Preventing these obesogenic environments from being established in the future could be beneficial for reducing the adverse effects obesogenic environments have on health. Education, or extending the current teachings around how to navigate this modern food climate, could be beneficial for achieving healthy lifestyles. This could include aspects of the food climate such as, how to effectively read, interpret and understand food labels on supermarket products, recognising processed versus unprocessed 'whole' foods, best practice for storing and cooking food, and appropriate portion sizes for individual lifestyle needs. Education would also benefit from being centred around or tailored for specific needs of different sociocultural groups, specifically indigenous Māori, rural, or high-deprivation populations. However, any public health campaign strategies that are to be promoted to any specific group would need to take into account the need for not jeopardising any social, cultural, or familial connections or responsibilities (which was positioned as significant to the client experience in chapters 8 and 9).

Addressing Barriers: Research Approaches

Rural / Indigenous Obesity Health Needs Research

There is very little variety of research on the obesity health issue or culturally appropriate ways to improve health outcomes for indigenous or rural populations in NZ. Previous research has already identified that culturally appropriate interventions that utilise a co-design process are beneficial for successful health promotion endeavours and improving health outcomes (Harding & Oetzel, 2019; Harding et al., 2021). Obesity management has also been demonstrated to be no different, with previous literature highlighting the benefits from culturally appropriate intervention designs (Eggleton et al., 2018; Forrest et al., 2016; Harding et al., 2021) for improving health outcomes. In addition, improving health for different rural areas requires a tailored approach as each community has different health needs. One example of a beneficial research approach is Community Based Participatory Research (CBPR) (Coghlan, 2014; Salimi et al., 2012) which could be useful and translatable to obesity health management for the rural communities of NZ. CBPR can also be

utilised for specific cultural groups to ensure that the community has a voice and autonomy over their health or any health changes. In addition, utilising research techniques that orientate around indigenous worldviews can ensure the development of a culturally relevant and safe research or health improvements. One example in NZ is utilising Kaupapa Māori research designs and Māori health models such as Te Whare Tapa Wha (Ministry of Health, 2015). While it is noted that there is minimal literature available, this is through the western-centric channels of sharing knowledge, such as peer-reviewed reports and journal publications, including indigenous journals. However, there are alternate ways of sharing health knowledge and it is possible that health understandings have been shared through indigenous storytelling avenues inter-generationally (Iseke, 2013; Martin, 2012) that are appropriate to particular cultures or communities. Potentially, there could be information about useful research approaches that can assist with improving obesity related health outcomes that are known by community members, but not outside that community's relationship boundaries. Including community lead, or co-lead indigenous research approaches to obesity literature could be useful for ensuring a range of health knowledge is included in any health improvement endeavours for specific rural communities.

Significant research is needed to identify the specific needs of rural general practices to deliver effective healthcare, including weight management healthcare. Clinicians (chapters 6 and 7) and clients (chapters 8 and 9) expressed that rural health needs are not understood at a national/government level and experience attention or neglect. Research into the systemic support that is desired by rural practices could help to identify areas of rural health improvement, which could transcend into other rural regions of NZ. For example, clinicians in this research claimed that more funding, staff, and accessible resources are needed to effectively deliver obesity healthcare (chapters 6 and 7). Research to recognise, define, and quantify the needs of rural practices would be a useful first step to measure if these needs are met or unmet in rural practices. This could help rural general practice be better equipped and supported in their roles when delivering future obesity healthcare. However, as previous literature has highlighted (Alsop-ten Hove, 2019; National Health Committee, 2010; Rural Health Alliance Aotearoa New Zealand, 2019), each rural community has their own unique locality and facility needs. Therefore, any research, or form of 'health needs assessment' of unmet rural healthcare or practice is recommended to be on a community-by-community basis and not a generalised rural level.

Research into Rural Nutritional Guidelines

Both clinicians (chapters 6 and 7) and clients (chapters 8 and 9) in this research thesis expressed confusion around nutritional guidelines and a lack of rurally tailored nutritional guidelines. While nutritional needs are recognised to be subject to many factors for each individual (Ministry of Health, 2017, 2021a) research into updating and developing nutritional guidelines that are better suited to a rural-specific culture, as well as indigenous culture, could be useful. Utilising a rural-specific nutritional guideline resource would assist with clinicians offering rurally tailored and applicable health advice to their clients, strengthen the therapeutic relationship as clients would be guided to more effective weight management strategies that are useful for them, and assist with improving obesity related health outcomes. While the ability to 'standardise' nutritional guidelines is a questionable task (due to the individualised nature of nutritional needs (Ministry of Health, 2017, 2021a)), establishing a reliable and trustworthy source of information for clinicians to offer their clients could reduce the potential for clients receiving contradictory information between clinicians (as highlighted in chapter 7 by clinicians and chapter 8 for clients). Research into what a rural food climate looks like could be investigated, as the national food climate has changed since the introduction of processed foods. The traditional, stereotypical 'rural lifestyle' has also changed,

whereby farm work that was considered manual labour, is now utilising technology and reducing physical activity. An appraisal into identifying what a rural-culture food climate consists of would be useful to inform any development of rural-specific nutritional guidelines in the future.

Feasibility of Regulated Obesity 'Expert' Professionals

Clients (chapters 8 and 9) expressed significant frustration about where to go, or who to go to, for reliable 'trust-worthy' dietary advice or information. Regulating obesity healthcare professionals with measurable qualifications could help ease this confusion and tension about who the obesity 'experts' are for clients. While there are regulated roles already in primary care and general practice (under the Health Practitioners Act 2003 (New Zealand Legislation, 2003)), this research indicated that clients lacked awareness of how to distinguish between professionals and some regarded nutritionists as 'experts' (chapter 9) despite this not being a regulated role in clinical contexts. Investigation into the feasibility of regulating specific obesity healthcare professionals or establishing obesity healthcare qualifications could be useful to reduce this difficulty for clients. Further to this, if public health campaigns are actioned and encourage the public to visit their healthcare professional, then these health professionals would need to be adequately trained to deliver effective obesity healthcare. Ensuring that the obesity 'specialists' that clients are referred to are competent and comprehensively educated for this role through regulated qualifications, could help clients recognise a 'trust-worthy' expert and ensure the advice they receive is reliable and not detrimental to their health long-term.

Positioning of General Practice as Best Suited Appraisal

Currently, the MoH sets out general practice to be 'best suited' to deliver obesity healthcare (Ministry of Health, 2017) whereby general practice clinicians have the ability to assess, measure, manage and monitor their client's weight over time. While the health system does provide some weight management interventions through general practice, this research thesis found that clinicians and clients positioned these options as not suitable or accessible by many living in rural communities. The findings from this research thesis' reviews, GP survey and interviews (chapters 3-9) indicate there to be many barriers to effective obesity healthcare in this rural general practice space. Significant barriers were highlighted by both clinicians (chapters 6 and 7) and clients (chapters 8 and 9) and orientated around a lack of ability for rural general practice to address the individual, holistic, and underlying complexities of obesity in a short consultation time frame and with minimal staff, resources, or 'effective' interventions available to offer rural clients. These are significant barriers experienced for a context that, for a long time now, considered 'best-suited' for delivering obesity healthcare. Obesity and obesity related comorbidity rates have continued to rise in the last 30 years (Ministry of Health, 2021b) which consequently, lead many clinicians and clients to question the concept that rural general practice is 'best suited' for such a complex and individualised health issue that is obesity.

Concerns around rural general practices' ability to deliver effective weight management was an issue for both clinicians and clients. Clinicians expressed a desire to be an effective health guide for their client's obesity related health issues, yet expressed they were in a near impossible position to do so, due to minimal rurally appropriate or indigenous culture appropriate weight management interventions, rurally relevant nutritional information, or minimal health professional referral pathways (such as no on-site dietitian located rurally) (chapters 4-7). Many clients expressed a desire for obesity healthcare from trusted, qualified professionals who could assess their 'whole-person' needs for such a complicated phenomenon (chapter 9) which they often felt was not achieved in their general practice consults (chapter 8 and 9). Consequently, some clients explicitly stated that

they would not seek advice from their general practitioner for weight management due to the conflicting messages and unhelpful advice they received (chapter 9). On the one hand, clinicians work in a system that expect them to deliver effective weight management in their role, yet provides 'impractical' interventions for the majority of their rural clients. On the other hand, clinicians have clients who, in some cases, do not even seek them for weight management advice in the first place (chapter 8 and 9), raising concerns about how a clinician is supposed to deliver effective obesity healthcare.

Despite the many barriers expressed with the current obesity healthcare model in general practice, clinicians and clients offered ideas on what is needed to overcome their barriers to effective weight management. Clinicians called for more rural health awareness, funding, resources, access to rurally appropriate interventions and a wider range of staff available rurally (such as dietitian) to deliver effective weight management strategies (chapter 5-7). Clients (chapter 8 and 9) called for healthcare that aligned with an obesity specialist service/s, which could offer weight management advice from qualified 'trust-worthy' health professionals who had the time, resources and understanding of the holistic and complex components that contribute to an individual's obesity. At this current time, rural general practice is not set up to accommodate these 'facilitators' of health identified by clinicians and clients, indicating an area for assessment and improvement moving forward.

The barriers identified and solutions offered by clinicians and clients suggest that potentially, the very context where weight management is thought to be effectively delivered, could be acting as a barrier to itself. While a general practice has advantages to delivering obesity healthcare due to the frequency of which clinicians see their clients over time, the positioning of weight management in general practice could be hindering the efficacy of its very aim (to deliver effective obesity healthcare). General practice is not set up to deliver effective healthcare due to interventions not being comprehensive (not including all four key elements of a weight management strategy as highlighted in chapter 3), nutritional guidelines not tailored to the unique rural or indigenous culture, lack of clinician support or training around the complexities of obesity healthcare, and a lack of time in the consultation to address holistic health factors potentially contributing to obesity health issues for their client (chapters 5-7). A recent NZ study indicated that obesity behavioural change interventions in primary care produced modest weight loss results, and that potentially due to the time, cost and the strain on the primary care workforce, these interventions are best aligned with, but delivered outside primary care (Krebs, 2022; Madigan et al., 2022). The views of clients and clinicians in this research thesis offer supportive evidence for Krebs' (Krebs, 2022) findings. However, with any obesity referral pathways outside general practice, there is again the issue of whether this is suitable for rural general practice, as weight management options outside general practice were questioned by these rural participants due to being largely inaccessible already.

Multi-disciplinary Team

Accessibility to weight management interventions that were rurally applicable was a key issue throughout this research from both clinicians and clients (chapter 6-9). Effective obesity healthcare delivery for rural general practice clinicians was positioned throughout this thesis research as difficult to achieve, with many barriers experienced and minimal 'useful' interventions available for clients to be guided to rurally. Whilst this research offers support for previous literature highlighting the need for reducing the strain, time, and cost issues on clinicians to deliver weight management interventions in their practice by having strong referral pathway options (Krebs, 2022), this study suggests an appraisal be conducted to determine the suitability of this change for rural health culture specifically. Rural health is notably different to their urban counterparts and as such could require a more tailored approach for addressing obesity barriers in general practice. Stronger

referral pathways were argued to be important from both rural client's and clinician's perspectives (chapters 6-9). However, accessibility to secondary care or specialist obesity management was a significant barrier due to time, locality and financial cost to attend, in addition to the perceived lack of understanding about a rural or indigenous food climate culture.

Two significant over-arching themes found in this research thesis suggest that perhaps, having a rurally based multi-disciplinary team located in general practice, would be more suitable for rural general practices to alleviate the strain on the clinician as well as access barriers for clients. The themes this research thesis found was the lack of healthcare options available rurally, and that many clinicians and clients called for a wider range of care to be available in the form of 'expert' qualified staff (chapters 6-9) such as dietitians, counsellors, social support facilitators, or obesity health educators who had the training, knowledge and time to address the complexities of obesity, especially with a rural or indigenous culture worldview. While this research thesis supports the need for reducing the strain on general practice clinicians dealing with a complex issue (that is calling for a specialist role systemically) by having expert help to refer to (Krebs, 2022), this research recommends ensuring this 'expert' help is locally accessible for rural clients. Potentially, having a rural general practice based multi-disciplinary team who can deliver effective, comprehensive obesity healthcare be available for the clinicians to guide their clients to, and who are accessible for rural clients, would be beneficial for reducing health barriers, inequities and improving health outcomes for rural communities.

Implications

As previously outlined in each of the publications, there are implications for each study within their specific field and each offer valuable insights into the barriers of obesity management. In addition, this research thesis has made important contributions to the field of obesity healthcare, and obesity in rural general practice, including: the first systematic review of the efficacy of weight management interventions in general practice; the first meta-ethnography review of NZ clinician and client perspectives of obesity healthcare in general practice; advances in knowledge of rural clinician and client perspectives of what 'effective' weight management is in general practice; advances in the synthesis of clinician and clients views in NZ; and novel contributions to knowledge of barriers to obesity healthcare in NZ rural general practice highlighting practical application avenues to explore moving forward. While it is important to continue advancing academic knowledge, debate and understand the lived experiences of obesity and its effective management, the findings in this research thesis are also of importance to health service providers and policy makers.

Implications for NZ Health

Firstly, this research thesis identified key factors that affect the efficacy and ability of rural general practice obesity healthcare services, and provided evidence that could help the national Rural Health Alliance and Health NZ with their efforts to reduce rural health inequity. The MoH has identified a key level of intervention to reduce inequity is to remove barriers in accessing health services and ensuring the equitable distribution of health services (Ministry of Health, 2002). The GP survey study (chapter 5) as well as the interviews with clinicians, clients and Māori health providers (chapters 6-9) identified that there were significant barriers to health access rurally, including a lack of health services distributed to rural areas. This indicates a key area of potential improvement from a national policy level, whereby improving obesity management outcomes can be partially contributed to through equitable distribution of rural health services. This approach could include ensuring obesity referral options through general practice be made more available (and accessible) rurally,

specialist healthcare staff (such as dietitians) are accessible for each rural area (not sharing nurses with other neighbouring towns for example), weight management programmes held in local rural locations (removing the barrier of inaccessibility of transport to a larger town), and developing interventions that are culturally appropriate and feasible for rural and indigenous clients' lifestyles. While this research focused on the rural area of the Waikato region, these improved approaches could also be adapted to other rural regions in NZ, each of whom will have their own specific health access inequity experiences. Further, improved approaches could also include equitable access to other obesity related healthcare such as the 'holistic' (as described by clients in chapters 8 and 9) or 'underlying' health issues (as described by clinicians in chapters 6 and 7) such as psychosocial, financial, or culturally specific health care and services.

Secondly, this research is timely as NZ is currently undergoing a national health reform (Pae Ora Healthy Futures Bill) (New Zealand Government, 2022) that aims to streamline the health system on a national level as well as facilitate equitable health outcomes. This includes equitable representation at executive level for minority groups including Māori, Pacific, people with disabilities and rural regions (New Zealand Government, 2022). In the initial set up of discussions for the new health system, rural health was not recognised as an area requiring specific representation, however, has later been granted access to representation and recognition as a health group in its own right, thanks to the Rural Health Alliance work efforts (Rural Health Alliance Aotearoa New Zealand, 2019). The original lack of recognition of rural health within the wider system supports the perspectives of clinicians (in chapters 6 and 7) who identified that rural health workforce and communities were commonly forgotten, not supported, or not recognised by their very own national health system. This research offers evidence for the Alliance and other Rural Health Organisations to utilise and inform best practice moving forward. While reducing inequities in NZ has always been on the list of 'things to do', the Government initiated a pro-equity mandate (Ministry of Health, 2018a). This mandate, combined with the current health reforms aimed at improving health services for all of NZ, including minority groups and those experiencing health inequity, indicates an ideal time to act to eliminate inequities in the rural obesity healthcare context.

Thirdly, this research offers a key insight into the discrepancies of what constitutes an 'effective' weight management intervention for clients in rural general practices, which, from the perspective of these clinicians and clients, are interventions that are rurally feasible, accessible, and work within the limitations of rural living conditions. Both clinicians (chapters 6 and 7) and clients (chapters 8 and 9) stressed that no intervention would be effective (as in, produce weight loss) unless it was applicable to the financial and sociocultural norms that the client lives in. This perception and identification of a lack of 'practical' weight management interventions available rurally, further supports the inequity of those working and living in rural health areas compared with their urban counterparts. This is a key area of improvement (regardless of where obesity healthcare is eventually situated) that could be addressed in the current health reforms, as this inequity transcends rural Waikato areas and is potentially relevant for other rural regions in NZ. The current health reform provides real opportunity to establish an obesity healthcare model which can operate in a way that meets the needs of rural communities and the rural health workforce.

Fourthly, this thesis identified new difficulties and elements of strain on the already understaffed rural general practice workforce experiencing inequity, which have not been explored previously in this context. While urban and rural health are notably different (Rural Health Alliance Aotearoa New Zealand, 2019; Triggs et al., 2007) this research thesis indicates the potential for some of the barriers to transcend rural general practice and be relevant to urban general practice also. There is currently a significant shortage of GPs and nurses in NZ, with rural areas experiencing more shortages than

urban (Gooch, 2021), further highlighting another significant level of inequity for rural health (Cate Broughton, 2021). Some general practices across NZ have closed their enrolment books and are not taking on any new clients as they are already at maximum capacity (Gooch, 2021). This suggests that the general practice workforce is working at an unsustainable rate, and that clients suffer from further access difficulties as they are unable to attend their local general practice and need to pay extra for emergency after hours clinics further distances away (Cate Broughton, 2021). In addition, the barriers identified from both rural clinicians and clients within the context of general practice, indicate there could be similar barriers being experienced in urban general practices. These include obesity stigma issues, difficulties discussing and treating obesity, obesogenic environments, and the impacts of the social determinants of health (chapters 6-9). This research thesis offers evidence of further contributors to the strained clinician role, which potentially, could be acting as an additional deterrent for overseas GPs and nurses to come and practice in NZ, and possibly perpetuating the shortage of clinicians and strain on the current workforce. Removing unnecessary parts of the clinician workload (such as developing an obesity referral pathway (Krebs, 2022)), or offering more systemic support for rural clinicians through adequate funding, resources and staff designated for obesity related healthcare, could assist with reducing some of the strain and inequity many rural clinicians experience in their roles (as identified in chapters 6 and 7).

Lastly, this research thesis sheds light on the potential that the current general practice context which is considered 'best suited' to deliver obesity healthcare, could inadvertently be acting as a barrier to its very aim. Clinicians and clients expressed concerns about the general practice ability to deliver effective comprehensive healthcare for such a complex and individualised health issue (chapters 6-9). While obesity can be viewed as a physiological health issue and therefore warranted to be 'treated' in the general practice context (as chapters 3-6 indicate), there are also significant factors outside the scope of general practice and physiological health domain which impact obesity management (as highlighted by chapters 4-9). For example, the obesogenic environment, sociocultural norms, and socioeconomic restrictions that clients live in. Efforts to mitigate these barriers could be beneficial, although these efforts are situated in other obesity healthcare sectors (such as population/public health, or secondary specialist care) and should be used in conjunction with general practice health improvement efforts. Whilst this is not the focus of this research thesis, any efforts made in any sector of obesity health would likely yield minimal 'effective' results if the very foundations and space where obesity healthcare is delivered (general practice) is found to be an active barrier unto itself. In light of the current health reforms and mandates to reduce health inequities (Ministry of Health, 2002, 2018a; New Zealand Government, 2022), this research thesis highlights that now is an opportune time to make equitable health changes for rural areas. Taking the time to critically reflect and appraise the suitability of rural general practice to deliver effective obesity healthcare can contribute to ensuring that health improvement goals have the best chance to be achieved. Appraising this current system could ensure any changes in the future align with strong foundations and are developed for sustainable, and effective obesity healthcare for all rural communities.

Indigenous Health

This research identified areas of indigenous healthcare that are experiencing barriers to obesity management in rural areas, which has received little attention in the past in this region. While this research thesis is not conducted from an indigenous worldview, the findings from Māori health professionals and clients who identify as Māori, offer insight into the additional barriers experienced for those engaging with a western-centric health model. The findings from this research thesis align with previous international indigenous research with other forms of healthcare that demonstrate for

cultures who do not operate from, or align with, a western-centric health model perspective, accessing healthcare in these spaces can be difficult and present challenges (Davy et al., 2016; Marrone, 2007; Nguyen et al., 2020). While the aim of this research was not to compare western and non-western centric views, barriers related to this concept were evident and indicated areas of tension for clinicians and clients, specifically as culturally appropriate obesity healthcare was scarcely available through their rural general practice. Whilst this research highlights that an appraisal of general practice could be useful to ensure rural obesity healthcare can be optimised, still situating obesity healthcare within any western model could be detrimental to improving the health of indigenous populations. Positioning obesity healthcare in a space that is not culturally appropriate or safe could be ineffective and act as another structural barrier. Instead, any appraisal of the current obesity healthcare structure should look to be conducted from both an indigenous Māori and western-centric health worldview. Any potential 'reconstruction' of the obesity healthcare model could also, therefore, benefit from being conducted through co-design methods to ensure that any structural inequity or power imbalances are not repeated unintentionally.

Limitations

As with any research, this study is not without its limitations. Each publication in this research thesis has highlighted the specific limitations to each study and will therefore not be repeated here. However, there are some limitations across the entirety of the research. First, was the timing of this research. This study began in February 2020, one month before NZ experienced its first Covid-19 lockdown. This consequently made any access to healthcare professionals, and clients, extremely limited as this research was, rightly so, not considered an 'essential' reason for using health professionals' limited time, or a valid reason to risk the possible spread of the Covid virus. This meant that fewer participants were recruited into this study than intended. However, despite these challenges, 17 clients (clients and community members) and 16 clinicians (GPs, nurses, and Māori Health professionals) were recruited out of a desired 20 participants for each group.

Second, the participants were limited to healthcare professionals in general practice. However, obesity is a complex health issue and many intervention options lie outside the scope of general practice. While the aim of this study was to investigate the rural general practice context, it is acknowledged that other health professionals could have important insights to the complexities in which this research was not able to conclude. These include professionals such as health coaches, kaiawhenas (advocates), Pasifika health professionals, private weight loss programme leaders, dietitians, nutritionists, endocrinologists, bariatric surgeons, psychologists, personal trainers, or health improvement practitioners.

Third, the role as a researcher is not without limitations, especially for qualitative work. Acknowledging and reflecting on my own life experiences and how the cultural groups I belong to (age, gender, ethnicity) shape and influence the way I perceive and interpret phenomena was a crucial part of this research (Braun & Clarke, 2006; Holloway & Biley, 2011; World Health Organization, 2022). My own experiences and worldviews can impact how I design research, interact with participants during data collection and how I interpret others' narratives (Braun & Clarke, 2006; Burr, 2015; Holloway & Biley, 2011). Reflecting on this, sharing my own lived experiences with obesity management with all participants enabled me to connect and build rapport with participants, reduce stigma perception and power imbalances which was a benefit for this research. Sharing my own experiences with participants also enabled a 'safe space' to share narratives which allowed for richer data to be elicited from participants and was considered a strength for this research. However, acknowledging the limitations of my knowledge and experiences including wider

empirical scientific processes assisted with strengthening this research. This included the use of a cultural advisor, collaborating with other researchers (with different life experiences and expertise), and utilising the wisdom of literature, my supervisors and wider network of more experienced researchers than myself.

Future Directions

There are three key components for future directions identified from this research thesis: increasing rural-specific research; appraisal of general practice context as 'best-suited', specifically for rural areas; and trial of effective intervention options for rural areas. These are detailed below.

Rural Focused Research Methods

Firstly, any future research about how to improve health outcomes for rural communities should include the voices of those communities, and include an awareness and appreciation that every rural community is unique. This research thesis found that minimal rural-specific research has been conducted in NZ, despite a large proportion of NZ (over 600,000) living rurally (Rural Health Alliance Aotearoa New Zealand, 2019), the understanding that rural culture is different to urban areas, and the already established knowledge of rural health inequities. Future research should look to have a rural-specific focus and incorporate the voices of the communities in which are being studied, including indigenous communities. Co-design research, CBPR, and Kaupapa Māori research are just some examples of research methodologies that could be utilised to ensure that each rural community has agency in their health development and outcomes. Research approaches that work alongside the populations that are experiencing inequity or poor health outcomes has been demonstrated to have positive and long-term impacts on health (Boulton et al., 2011; Kidd et al., 2021; Ministry of Health, 2015; Te Morenga et al., 2018; Tipene-Leach et al., 2013; Verbiest et al., 2018) and are recommended to be utilised for future obesity research. Including the perspectives of Māori, Pacific, rural groups, and those who have a lived experience with a phenomenon, in this case obesity, when developing healthcare service improvements is crucial for success, as previous literature has highlighted (Bridges, 2017; Durie, 1997; Manokaran et al., 2021; Orser et al., 2021). Using an appropriate research approach that generates accurate findings and receivable intervention options can assist with setting the foundations for successful health improvement in the long-term. Research and intervention strategies are shaped by each community and will differ between the rural communities across each region, so it is important to work with the people of said community. In addition, the space in which any intervention should be placed also needs to be culturally appropriate, particularly for Māori populations, as previous literature has indicated that indigenous worldviews do not align with western-centric worldviews and can become incompatible, hindering health outcomes. Utilising co-lead and community interventions from inception to delivery has been demonstrated to be effective in the past (Coghlan, 2014; Eggleton et al., 2018; Kidd et al., 2021; Salimi et al., 2012; Te Morenga et al., 2018) and should be used for future obesity health research in rural NZ communities.

Appraisal of General Practice Context

Secondly, future research should look to conduct trials of locality based primary care interventions incorporating general practice, Māori providers and local health practitioners including pharmacists, physiotherapists, dietitians, midwives, and health coaches for example. This research should also look to assess how general practice can be better integrated into a community driven, culturally appropriate, weight management centre. Urban general practices have the luxury of access to a range of weight management options to offer their clients, however, the clinicians and clients in this

thesis stressed the lack of options available rurally. Rural general practice clinicians are well suited for supportive roles for weight management and act as excellent health informants and guides for their clients. However, as clinicians highlighted, there was limited options available to guide their clients to, which risked jeopardising the strength of the therapeutic relationship and potentially leading to poorer health engagement or outcomes for the client in the future.

Establishing a multi-disciplinary team based in general practice could be a useful avenue to reducing the barriers expressed by these rural communities and clinicians and reduce inequity. Multi-disciplinary teams could look to include other health professionals that understand the more nuanced and complex issues with obesity management and the rural lifestyle culture, as well as have the time to assess the individual client's wider health needs. For example, other members of the general practice team could include a dietitian, counsellor, kaiawhinas (advocates), social worker or facilitator of other social services (violence prevention or financial help services). Having multi-disciplinary teams that are based within rural general practice could enable the workload of already strained rural clinicians to ease, ensure clients are being guided to qualified health professionals who understand the limitations and nuances of rural culture, and reduce access inability for rural communities. Trialling a rural general practice multi-disciplinary team 'intervention' for delivering effective weight management and improving health outcomes should be explored in the near future.

Development and Trial of Effective Interventions for Rural areas

Thirdly, future research should look to develop an effective weight management strategy that is comprehensive, accessible for clinicians to guide their clients to, and is suitable for the rural, and indigenous cultures. Regardless of whether a multi-disciplinary team is established or not, rural clinicians need effective interventions that they can guide their clients to, as currently, options are not available, accessible, practical, or culturally appropriate. The two review chapters (chapters 3 and 4), and the narratives from both clinicians and clients (chapters 6-9), highlighted a significant lack of comprehensive, multi-levelled, culturally appropriate interventions. Exploring what a 'rurally effective' weight intervention actually looks like is crucial if any health improvements are to be made. Future research should look to work with rural communities to develop and trial weight management interventions that are tailored to the needs of rural communities and work within these rural general practice limitations and spaces. These interventions could be different for each unique rural community and should be tailored to the specific needs of each rural area. However, this research recommends that all interventions developed or trialled include the four main elements of effective weight management (dietary control, exercise engagement, behavioural change actioned in culturally appropriate ways) as chapter 3 indicated, none of the current available interventions utilise all four in combination, despite being recognised as the most effective strategy.

Further to this, as highlighted by the clinicians and clients in chapters 6-9, any interventions trialled should be rurally feasible and accessible for the rural and indigenous sociocultural norms, as well as having health 'outcomes' that are wanted by the individual and community. Any interventions developed should look to include the wider elements of health that impact obesity (as called for by both clinicians and clients in chapters 6-9) in the form of physical and psychosocial comorbidity factors, as well as social determinant and cultural factors. Developing an intervention with each rural community would be useful for this, as the outcomes of the intervention should include those desired by the individuals in said communities. As chapters 6-9 have indicated, these health outcomes can extend beyond the clinical markers of obesity health related improvements. During the evaluation of any intervention development or trial, any 'efficacy' markers of interventions should also include the wider aspects to health improvement, including comorbidity avoidance, not just weight loss results or BMI reduction. These could include factors that were expressed to be

significant from the participants in this study, such as, psychosocial wellbeing, spiritual health, sociocultural connections and health, mental health improvements as well as the physiological weight, blood sugar levels or cardiovascular disease risk levels. Assessing the uptake of the intervention in rural areas should also be included in consideration of the overall 'efficacy' of a rurally tailored, co-designed weight management strategy, as health improvements will be hindered if interventions are not received well by rural communities.

Lastly, any improvements or trials of interventions should not be actioned in isolation for such a complex health issue. Other obesity improvement work is being conducted in other sectors of obesity health, including population level and secondary care (Elley et al., 2008; Krebs et al., 2012; Ministry of Health, 2022b; Murphy et al., 2003; Swinburn, 1999). Any interventions made in the general practice sector of obesity healthcare should look to complement the other sectors to maximise effectiveness. Obesity is an interconnected health risk with no 'quick-fix' option, and it will take years before results can make an impact at a population level. Approaching obesity healthcare in the general practice sector should also reflect and appraise its effectiveness in the wider health system including public health and secondary care. An updated, comprehensive, multi-layered, culturally inclusive approach could be beneficial to align with the modern food environment, sociocultural norms, and 'holistic' obesity health needs of clients that have overlap with population and secondary health sectors. However, any intervention development or trial with secure, sustainable, and complementary foundations will assist in maximising efficacy of obesity healthcare and improve health outcomes for all NZ communities, specifically rural and indigenous.

Conclusion

This research was novel in that it addressed key barriers within the pervasive health issue of obesity in the rural Waikato general practice context, which has not been done previously. Utilising a mixed method, sequential explanatory research design, this study found that there are significant difficulties to the delivery of obesity healthcare in the general practice space. Many barriers exist both within and outside the scope of general practice, further hindering the efforts of an already stretched rural health workforce to reduce obesity rates and improve their clients' health. The barriers expressed by clinicians and clients had significant overlap, with both groups experiencing issues with raising, discussing, identifying 'effective' weight management interventions, as well as barriers external to the general practice context, including social determinants of health, obesogenic environment, lack of obesity health professional regulation, and sociocultural norms. With the obesity and obesity-related comorbidity rates increasing in the last 30 years, the current weight management strategies could be considered ineffective. An appraisal of general practice being best suited to be a main driver of obesity healthcare delivery is recommended, as potentially, clinicians working in this space could be better suited as a supportive role and guide their clients to comprehensive, tailored, 'holistic' obesity healthcare professionals who can address all the complexities that come with 'treating' obesity. Future research should look to generate rural specific weight management interventions, rural and indigenous specific health research and interventions, as well as enabling better access to obesity healthcare for rural areas to reduce health inequities. While much of the narrative of clinicians and clients focused on the difficulties of weight management, there are many narratives available (outside this research thesis) that highlight the success of improving quality of life and obesity-related health outcomes for clients, indicating the possibility for positive health changes. In a similar way that effective weight management entails an entire lifestyle change for success and sustainability, the current obesity healthcare model in general

practice requires a radical modernisation to meet the changed obesity and sociocultural norm climates in NZ.

References

- Abbott, S., Parretti, H. M., & Greenfield, S. (2021). Experiences and perceptions of dietitians for obesity management: a general practice qualitative study. *Journal of Human Nutrition and Dietetics*, 34(3), 494-503.
- Abilés, V., Rodríguez-Ruiz, S., Abilés, J., Mellado, C., García, A., De La Cruz, A. P., & Fernández-Santaella, M. C. (2010). Psychological characteristics of morbidly obese candidates for bariatric surgery. *Obesity Surgery*, 20(2), 161-167.
- Adab, P., Pallan, M., & Whincup, P. H. (2018). Is BMI the best measure of obesity? *British Medical Journal*, 360.
- Adams, W. (2015). Conducting Semi-Structured Interviews. In K. E. Newcomer, H. P. Hatry & J. S. Wholey. *Handbook of Practical Program Evaluation*, 492-505.
<https://doi.org/10.1002/9781119171386.ch19>
- Ahern, A. L., Olson, A. D., Aston, L. M., & Jebb, S. A. (2011). Weight Watchers on prescription: An observational study of weight change among adults referred to Weight Watchers by the NHS. *BMC Public Health*, 11(1), 434. <https://doi.org/10.1186/1471-2458-11-434>
- Albuquerque, D., Stice, E., Rodríguez-López, R., Manco, L., & Nóbrega, C. (2015). Current review of genetics of human obesity: from molecular mechanisms to an evolutionary perspective. *Molecular genetics and genomics*, 290(4), 1191-1221.
- Allen, J. T., Cohn, S. R., & Ahern, A. L. (2015). Experiences of a commercial weight-loss programme after primary care referral: A qualitative study. *British Journal of General Practice*, 65(633), e248-e255. <https://doi.org/10.3399/bjgp15X684409>
- Alsop-ten Hove, B. (2019). Tackling rural health inequities from the ground up. *New Zealand Medical Student Journal*, (29), 29-31.
- Ananthakumar, T., Jones, N. R., Hinton, L., & Aveyard, P. (2020). Clinical encounters about obesity: Systematic review of patients' perspectives. *Clinical Obesity*, 10(1), e12347.
- Bacon, L. (2010). *Health at every size: The surprising truth about your weight*. BenBella Books.
- Ball, K., Crawford, D., & Owen, N. (2000). Obesity as a barrier to physical activity. *Australian and New Zealand Journal of Public Health*, 24(3), 331-333.
- Ball, K., Crawford, D., Jeffery, R., & Brug, J. (2010). The role of socio-cultural factors in the obesity epidemic. *Obesity Epidemiology: from Aetiology to Public Health*, 2, 105-118.
- Beckingsale, L., Fairbairn, K., & Morris, C. (2016). Integrating dietitians into primary health care: benefits for patients, dietitians and the general practice team. *Journal of Primary Health Care*, 8(4), 372-380.
- Bell, J., Crawford, R., & Holloway, K. (2018). Core components of the rural nurse specialist role in New Zealand. *Rural & Remote Health*, 18(2).
- Bell, A., Swinburn, B., Amosa, H., & Scragg, R. K. (2001). A nutrition and exercise intervention program for controlling weight in Samoan communities in New Zealand. *International Journal of Obesity*, 25(6), 920-927.

- Bell, R., Smith, C., Hale, L., Kira, G., & Tumilty, S. (2017). Understanding obesity in the context of an Indigenous population—A qualitative study. *Obesity Research & Clinical Practice*, *11*(5), 558-566.
- Bevir, M. (Ed.) (2010). *Anti-Foundationalism*. SAGE Publications, Inc.
<https://dx.doi.org/10.4135/9781412958660>
- Bhurosy, T., & Jeewon, R. (2013). Pitfalls of using body mass index (BMI) in assessment of obesity risk. *Current Research in Nutrition and Food Science Journal*, *1*(1), 71-76.
- Blackburn, M., Stathi, A., Keogh, E., & Eccleston, C. (2015). Raising the topic of weight in general practice: perspectives of GPs and primary care nurses. *BMJ Open*, *5*(8), e008546.
- Bleich, S. N., Gudzone, K. A., Bennett, W. L., Jarlenski, M. P., & Cooper, L. A. (2013). How does physician BMI impact patient trust and perceived stigma? *Preventive Medicine*, *57*(2), 120-124. <https://doi.org/https://doi.org/10.1016/j.ypmed.2013.05.005>
- Bødker, M., Pisinger, C., Toft, U., & Jørgensen, T. (2015). The rise and fall of the world's first fat tax. *Health Policy*, *119*(6), 737-742.
- Boero, N. (2013). Obesity in the media: social science weighs in. *Critical Public Health*, *23*(3), 371-380.
- Boulton, A., Gifford, H., Kauika, A., & Parata, K. (2011). Māori Health Promotion: Challenges for best practice. *AlterNative: An International Journal of Indigenous Peoples*, *7*(1), 26-39.
<https://doi.org/10.1177/117718011100700103>
- BPACnz. (2021). *Antibiotics: choices for common infections*. BPAC NZ.
<https://bpac.org.nz/antibiotics/guide.aspx>
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, *3*(2), 77-101.
- Braun, V., & Clarke, V. (2021a). Can I use TA? Should I use TA? Should I not use TA? Comparing reflexive thematic analysis and other pattern-based qualitative analytic approaches. *Counselling and Psychotherapy Research*, *21*(1), 37-47.
- Braun, V., & Clarke, V. (2021b). One size fits all? What counts as quality practice in (reflexive) thematic analysis? *Qualitative Research in Psychology*, *18*(3), 328-352.
- Brewis, A. A. (2010). *Obesity: Cultural and biocultural perspectives*. Rutgers University Press.
- Brewis, A. A. (2014). Stigma and the perpetuation of obesity. *Social Science & Medicine*, *118*, 152-158.
- Brewis, A. A., McGarvey, S. T., Jones, J., & Swinburn, B. A. (1998). Perceptions of body size in Pacific Islanders. *International Journal of Obesity*, *22*(2), 185-189.
- Bridges, D. (2017). 'Nothing about us without us': The ethics of outsider research. In *Philosophy in Educational Research*, 341-361. Springer. https://doi.org/10.1007/978-3-319-49212-4_20
- British Psychological Society. (2019). *Psychological perspectives on obesity: Addressing policy, practice and research priorities*. <https://www.bps.org.uk/news-and-policy/psychological-perspectives-obesity-addressing-policy-practice-and-research>

- Broughton, C. (2021, March 11). Doctor shortage forcing GP clinics to turn away new patients. *Stuff*. <https://www.stuff.co.nz/national/health/124477572/doctor-shortage-forcing-gp-clinics-to-turn-away-new-patients>
- Bruch, H. (1974). *Eating disorders. Obesity, anorexia nervosa, and the person within*. Routledge & Kegan Paul.
- Buchanan, D. R. (2008). Autonomy, paternalism, and justice: ethical priorities in public health. *American Journal of Public Health, 98*(1), 15-21.
- Buchanan, D. R. (2015). Promoting justice and autonomy in public policies to reduce the health consequences of obesity. *Kennedy Institute of Ethics Journal, 25*(4), 395-417.
- Buffart, L. M., Allman-Farinelli, M., King, L. A., van der Ploeg, H. P., Smith, B. J., Kurko, J., & Bauman, A. E. (2008). Are general practitioners ready and willing to tackle obesity management? *Obesity Research & Clinical Practice, 2*(3), 189-194. <https://doi.org/https://doi.org/10.1016/j.orcp.2008.04.008>
- Burr, V. (2015). *Social constructionism*. Routledge. <https://doi.org/https://doi.org/10.1016/B978-0-08-097086-8.24049-X>
- Butsch, W. S., Kushner, R. F., Alford, S., & Smolarz, B. G. (2020). Low priority of obesity education leads to lack of medical students' preparedness to effectively treat patients with obesity: results from the U.S. medical school obesity education curriculum benchmark study. *BMC Medical Education, 20*(1), 23. <https://doi.org/10.1186/s12909-020-1925-z>
- Campbell, K., Engel, H., Timperio, A., Cooper, C., & Crawford, D. (2000). Obesity management: Australian general practitioners' attitudes and practices. *Obesity Research, 8*(6), 459-466.
- Campos, P. (2013). The end of the obesity epidemic. *Critical Public Health, 23*(3), 381-382. <https://doi.org/10.1080/09581596.2013.783729>
- Campos, P. F. (2004). *The obesity myth: Why America's obsession with weight is hazardous to your health*. Penguin.
- Canetti, L., Bachar, E., & Berry, E. M. (2002). Food and emotion. *Behavioural Processes, 60*(2), 157-164.
- Carr, D., & Friedman, M. A. (2005). Is obesity stigmatizing? Body weight, perceived discrimination, and psychological well-being in the United States. *Journal of Health and Social Behavior, 46*(3), 244-259.
- Carryer, J., Boddy, J., & Budge, C. (2011). Rural nurse to nurse practitioner: an ad hoc process. *Journal of Primary Health Care, 3*(1), 23-28.
- Carter, M. A., & Swinburn, B. (2004). Measuring the 'obesogenic' food environment in New Zealand primary schools. *Health Promotion International, 19*(1), 15-20. <https://doi.org/10.1093/heapro/dah103>
- Cassim, S., Kidd, J., Rolleston, A., Keenan, R., Aitken, D., Firth, M., Middleton, K., Chepulis, L., Wong, J., & Hokowhitu, B. (2021). Hā Ora: Barriers and enablers to early diagnosis of lung cancer in primary healthcare for Māori communities. *European Journal of Cancer Care, 30*(2), e13380.

- Claridge, R., Gray, L., Stubbe, M., Macdonald, L., Tester, R., & Dowell, A. C. (2014). General practitioner opinion of weight management interventions in New Zealand. *Journal of Primary Health Care*, 6(3), 212-220. <https://doi.org/10.1071/hc14212>
- Clough, P., & Destremau, K. (2015). The wider economic and social costs of obesity: A discussion of the non-health impacts of obesity in New Zealand. *Wellington: New Zealand Institute of Economic Research*.
- Coghlan, D., & Brydon-Miller, M. (2014). *Community-Based Participatory Research*. In. SAGE Encyclopaedia of Action Research. <https://doi.org/10.4135/9781446294406>
- Collins, C. E., Morgan, P. J., Hutchesson, M. J., & Callister, R. (2013). Efficacy of standard versus enhanced features in a Web-based commercial weight-loss program for obese adults, part 2: randomized controlled trial. *Journal of Medical Internet Research*, 15(7), e140.
- Cooper, C. (2021). *Fat activism: A radical social movement*. Intellect Books.
- Corbetta, P. (2003). *Social Research: Theory, Methods and Techniques*. In. SAGE Publications, Ltd. <https://doi.org/10.4135/9781849209922>
- Cordo, J. (2007). Fast Food: Clogging the World's Arteries. In *Fresh Ink: Essays From Boston College's First-Year Writing Seminar* (Vol. 9, No. 1).
- Corsica, J. A., & Pelchat, M. L. (2010). Food addiction: true or false? *Current Opinion in Gastroenterology*, 26(2), 165-169.
- Couch, D., Thomas, S. L., Lewis, S., Blood, R. W., Holland, K., & Komesaroff, P. (2016). Obese people's perceptions of the thin ideal. *Social Science & Medicine*, 148, 60-70. <https://doi.org/https://doi.org/10.1016/j.socscimed.2015.11.034>
- Crawford, D., Owen, N., Broom, D., Worcester, M., & Oliver, G. (1998). Weight-control practices of adults in a rural community. *Australian and New Zealand Journal of Public Health*, 22(1), 73-79.
- Cruickshank, J. (2020). *Epistemology*. In P. Atkinson, S. Delamont, A. Cernat, J.W. Sakshaug, & R.A. Williams (Eds.), *SAGE Research Methods Foundations*. <https://doi.org/10.4135/9781526421036884558>
- Curgenvin, L. K. (2016). *Clinicians' and Consumers' Perspectives of Obesity Treatments* (Doctoral Dissertation, University of Otago).
- Curry, L., & Nunez-Smith, M. (2015). *Mixed Methods in Health Sciences Research: A Practical Primer*. In. SAGE Publications, Inc. <https://doi.org/10.4135/9781483390659>
- Davis-Wheaton, J. (2013). Breaking down health barriers in rural areas. *Kai Tiaki: Nursing New Zealand*, 19(2), 2.
- Davy, C., Harfield, S., McArthur, A., Munn, Z., & Brown, A. (2016). Access to primary health care services for Indigenous peoples: A framework synthesis. *International Journal for Equity in Health*, 15(1), 163. <https://doi.org/10.1186/s12939-016-0450-5>
- Dean, S., Elley, C., & Kerse, N. (2007). Physical activity promotion in general practice: Patient attitudes. *Australian Family Physician*, 36(12), 1061.

- de Costa, K. (2021, May 8). Complementary medicines for weight loss not justified, study suggests. *BBC*. <https://www.bbc.com/news/health-57039848>
- Donaghue, N., & Clemitshaw, A. (2012). 'I'm totally smart and a feminist...and yet I want to be a waif': Exploring ambivalence towards the thin ideal within the fat acceptance movement. *Women's Studies International Forum*, 35(6), 415-425. <https://doi.org/https://doi.org/10.1016/j.wsif.2012.07.005>
- Doolan-Noble, F., Ross, J., Johnson, R., Birks, M., Francis, K., & Mills, J. (2019). Rural nursing in Aotearoa New Zealand and Australia: embracing strategic foresight to sustain tomorrow's workforce. *Scope Contemp Res Topics Health Wellbeing*, 4, 58-62.
- Doolan-Noble, F., Pullon, S., Dowell, T., Fuller, D., & Love, T. (2019). Men living with obesity in New Zealand: What does this mean for health care in general practice?. *Obesity Research & Clinical Practice*, 13(3), 233-239. <https://doi.org/10.1016/j.orcp.2019.02.005>
- Durie, M. (1997). Māori cultural identity and its implications for mental health services. *International Journal of Mental Health*, 26(3), 23-25.
- Durie, M. H. (2003). The health of indigenous peoples: depends on genetics, politics, and socioeconomic factors. *BMJ*, 326(7388), 510-511. <https://doi.org/10.1136/bmj.326.7388.510>
- Edmonds, W., & Kennedy, T. (2017). Phenomenological perspective. In *An Applied Guide to Research Designs: Quantitative, Qualitative, and Mixed Methods* (Second ed., pp. 168-176). SAGE Publications, Inc, <https://doi.org/10.4135/9781071802779>
- Eggleton, K., Stewart, L., & Kask, A. (2018). Ngātiwai Whakapakari Tinana: strengthening bodies through a Kaupapa Māori fitness and exercise programme. *Journal of Primary Health Care*, 10(1), 25-30. <https://doi.org/https://doi.org/10.1071/HC17068>
- Elley, C. R., Kenealy, T., Robinson, E., Bramley, D., Selak, V., Drury, P. L., Kerse, N., Pearson, J., Lay-Yee, R., & Arroll, B. (2008). Cardiovascular risk management of different ethnic groups with type 2 diabetes in primary care in New Zealand. *Diabetes Research and Clinical Practice*, 79(3), 468-473. <https://doi.org/10.1016/j.diabres.2007.09.018>
- Environmental Health Indicators New Zealand. (2018). *Socioeconomic deprivation profile*. <https://www.ehinz.ac.nz/indicators/population-vulnerability/socioeconomic-deprivation-profile/>
- Epling, J. W., Morley, C. P., & Ploutz-Snyder, R. (2011). Family physician attitudes in managing obesity: a cross-sectional survey study. *BMC Research Notes*, 4(1), 473.
- Epstein, L., & Ogden, J. (2005). A qualitative study of GPs' views of treating obesity. *The British Journal of General Practice: the Journal of the Royal College of General Practitioners*, 55(519), 750-754.
- Ertin, H., & Özaltay, B. (2011). Some ethical reflections on weight-loss diets. *Turkish Journal of Medical Sciences*, 41(6), 951-957.
- Fleck, F. (2003). WHO challenges food industry in report on diet and health. *BMJ: British Medical Journal*, 326(7388), 515.
- Forhan, M., & Gill, S. V. (2013). Obesity, functional mobility and quality of life. *Best Practice & Research Clinical Endocrinology & Metabolism*, 27(2), 129-137.

- Forman-Hoffman, V., Little, A., & Wahls, T. (2006). Barriers to obesity management: a pilot study of primary care clinicians. *BMC Family Practice*, 7(1), 35. <https://doi.org/10.1186/1471-2296-7-35>
- Forrest, R., Taylor, L. A., Roberts, J., Pearson, M., Foxall, D., & Scott-Chapman, S. (2016). Patu™: Fighting fit, fighting fat! The Hinu Wero approach. *AlterNative: An International Journal of Indigenous Peoples*, 12(3), 282-297.
- Frey, B. (2018a). *Content Analysis*. In The SAGE Encyclopaedia of Educational Research, Measurement, and Evaluation. <https://doi.org/10.4135/9781506326139>
- Frey, B. (2018b). *Descriptive Statistics*. In The SAGE Encyclopaedia of Educational Research, Measurement, and Evaluation. <https://doi.org/10.4135/9781506326139>
- Fuller, N., Fong, M., & Lau, N. (2014). Commercial weight loss programs and their effectiveness in managing obesity. *Managing and Preventing Obesity: Behavioural Factors and Dietary Interventions*.
- Fuller, N. R., Carter, H., Schofield, D., Hauner, H., Jebb, S. A., Colagiuri, S., & Caterson, I. D. (2014). Cost effectiveness of primary care referral to a commercial provider for weight loss treatment, relative to standard care: a modelled lifetime analysis. *International Journal of Obesity*, 38(8), 1104-1109. <https://doi.org/10.1038/ijo.2013.227>
- Garaulet, M., Canteras, M., Morales, E., López-Guimerà, G., Sánchez-Carracedo, D., & Corbalán-Tutau, M. (2012). Validation of a questionnaire on emotional eating for use in cases of obesity; the Emotional Eater Questionnaire (EEQ). *Nutrición hospitalaria*, 27(2), 645-651.
- Gard, M. (2011a). 5 Neoliberalism, the 'obesity epidemic' and the challenge to theory. In *Ethical Consumption* (pp. 71-84). Routledge.
- Gard, M. (2011b). Truth, belief and the cultural politics of obesity scholarship and public health policy. *Critical Public Health*, 21(1), 37-48. <https://doi.org/10.1080/09581596.2010.529421>
- Gard, M., & Wright, J. (2005). *The obesity epidemic: Science, morality and ideology*. Routledge.
- Glenister, K. M., Malatzky, C. A., & Wright, J. (2017). Barriers to effective conversations regarding overweight and obesity in regional Victoria. *Australian Family Physician*, 46(10), 769.
- Goettler, A., Grosse, A., & Sonntag, D. (2017). Productivity loss due to overweight and obesity: a systematic review of indirect costs. *BMJ Open*, 7(10), e014632-e014632. <https://doi.org/10.1136/bmjopen-2016-014632>
- Goffman, E. (1963). *Stigma. Notes on the Management of Spoiled Identity*. London: Penguin Books.
- Gooch, C. (2021, August 16). Nationwide GP shortage a 'workforce' and 'workload' issue. *Stuff*. <https://www.stuff.co.nz/national/health/126040965/nationwide-gp-shortage-a-workforce-and-workload-issue>
- Goodyear-Smith, F., & Buetow, S. (2001). Power issues in the doctor-patient relationship. *Health Care Analysis*, 9(4), 449-462.

- Government UK. (2019). *Guidance Adult Obesity: Applying All Our Health*.
<https://www.gov.uk/government/publications/adult-obesity-applying-all-our-health/adult-obesity-applying-all-our-health>
- Gray, L., Chamberlain, R., & Morris, C. (2016). "Basically you wait for an 'in'": community pharmacist views on their role in weight management in New Zealand. *Journal of Primary Health Care, 8*(4), 365-371.
- Gray, L., Stubbe, M., Macdonald, L., Tester, R., Hilder, J., & Dowell, A. C. (2018). A taboo topic? How General Practitioners talk about overweight and obesity in New Zealand. *Journal of Primary Health Care, 10*(2), 150-158. <https://doi.org/10.1071/hc17075>
- Gudzune, K. A., Doshi, R. S., Mehta, A. K., Chaudhry, Z. W., Jacobs, D. K., Vakil, R. M., Lee, C. J., Bleich, S. N., & Clark, J. M. (2015). Efficacy of commercial weight-loss programs: an updated systematic review. *Annals of Internal Medicine, 162*(7), 501-512.
- Guinness World Record Limited. (2020). *Heaviest Man Ever*.
<https://www.guinnessworldrecords.com/world-records/heaviest-man>
- Harding, T., & Oetzel, J. (2019). Implementation effectiveness of health interventions for indigenous communities: a systematic review. *Implementation Science, 14*(1), 1-18.
- Harding, T., Oetzel, J. G., Foote, J., & Hepi, M. (2021). Perceptions of co-designing health promotion interventions with Indigenous communities in New Zealand. *Health Promotion International, 36*(4), 964-975.
- Harris, J. L., Bargh, J. A., & Brownell, K. D. (2009). Priming effects of television food advertising on eating behavior. *Health Psychology, 28*(4), 404-413. <https://doi.org/10.1037/a0014399>
- Haslam, D. (2007). Obesity: a medical history. *Obesity Reviews, 8*, 31-36.
- Hauora Taiwhenua Rural Health Network. (2023). *Rural Primary Healthcare in New Zealand*.
<https://htrhn.org.nz/recruitment/for-doctors-nurse-practitioners/working-in-nz/>.
- Hawkins, N., Richards, P. S., Granley, H. M., & Stein, D. M. (2004). The impact of exposure to the thin-ideal media image on women. *Eating disorders, 12*(1), 35-50.
- Hebebrand, J., Albayrak, Ö., Adan, R., Antel, J., Dieguez, C., de Jong, J., Leng, G., Menzies, J., Mercer, J. G., & Murphy, M. (2014). "Eating addiction", rather than "food addiction", better captures addictive-like eating behavior. *Neuroscience & Biobehavioral Reviews, 47*, 295-306.
- Hector, C. (2012). Nudging towards Nutrition: Soft Paternalism and Obesity-Related Reform. *Food & Drug LJ, 67*, 103.
- Henderson, E. (2015). Obesity in primary care: a qualitative synthesis of patient and practitioner perspectives on roles and responsibilities. *British Journal of General Practice, 65*(633), e240-e247.
- Hill, J. O., Wyatt, H.R., & Peters, J.C. (2012). Energy balance and obesity. *Circulation, 126*(1), 126-132. <https://doi.org/10.1161/CIRCULATIONAHA.111.087213>
- Hoffman, S., & Kumar, V. (2020). *Ontology*. In P. Atkinson, S. Delamont, A. Cernat, J.W. Sakshaug, & R.A. Williams (Eds.), SAGE Research Methods Foundations
<https://doi.org/10.4135/9781526421036869920>

- Holloway, I., & Biley, F. C. (2011). Being a qualitative researcher. *Qualitative Health Research*, 21(7), 968-975.
- Howard, N. J., Hugo, G. J., Taylor, A. W., & Wilson, D. H. (2008). Our perception of weight: Socioeconomic and sociocultural explanations. *Obesity Research & Clinical Practice*, 2(2), 125-131. <https://doi.org/https://doi.org/10.1016/j.orcp.2008.03.003>
- Howatson, A., Wall, C., & Turner-Benny, P. (2015). The contribution of dietitians to the primary health care workforce. *Journal of Primary Health Care*, 7(4), 324-332.
- Iseke, J. (2013). Indigenous storytelling as research. *International Review of Qualitative Research*, 6(4), 559-577.
- Ivankova, N. V., Creswell, J. W., & Stick, S. L. (2006). Using mixed-methods sequential explanatory design: From theory to practice. *Field Methods*, 18(1), 3-20.
- Jani, R., Rush, E., Crook, N., & Simmons, D. (2018). Availability and price of healthier food choices and association with obesity prevalence in New Zealand Māori. *Asia Pacific Journal of Clinical Nutrition*, 27(6), 1357-1365.
- Jebb, S. A., Ahern, A. L., Olson, A. D., Aston, L. M., Holzapfel, C., Stoll, J., Amann-Gassner, U., Simpson, A. E., Fuller, N. R., & Pearson, S. (2011). Primary care referral to a commercial provider for weight loss treatment versus standard care: a randomised controlled trial. *The Lancet*, 378(9801), 1485-1492.
- Johnson, F., Beeken, R. J., Croker, H., & Wardle, J. (2014). Do weight perceptions among obese adults in Great Britain match clinical definitions? Analysis of cross-sectional surveys from 2007 and 2012. *BMJ Open*, 4(11).
- Jull, A., Lawes, C., Eyles, H., Maddison, R., Gorton, D., Arcus, K., Chee, N., & Taylor, B. (2011). Guidelines Summary: Clinical guidelines for weight management in New Zealand adults, children and young people. *Journal of Primary Health Care*, 3(1), 66-71.
- Kidd, J., Cassim, S., Rolleston, A., Keenan, R., Lawrenson, R., Sheridan, N., Warbrick, I., Ngahe, J., & Hokowhitu, B. (2021). Hā Ora: Reflecting on a Kaupapa Māori Community-Engaged Co-design Approach to Lung Cancer Research. *International Journal of Indigenous Health*, 16(2).
- Krebs, J. (2022). Diabetes and Obesity Research Review. *Research Review*. <https://www.researchreview.co.nz/getmedia/4d1cc96f-1650-4f11-9da6-d18722cbd43c/Diabetes-and-Obesity-Research-Review-Issue-159.pdf.aspx?ext=.pdf>
- Krebs, J., Elley, C., Parry-Strong, A., Lunt, H., Drury, P., Bell, D., Robinson, E., Moyes, S., & Mann, J. (2012). The Diabetes Excess Weight Loss (DEWL) Trial: a randomised controlled trial of high-protein versus high-carbohydrate diets over 2 years in type 2 diabetes. *Diabetologia*, 55(4), 905-914.
- Kruger, H. S., Puoane, T., Senekal, M., & Van Der Merwe, M. T. (2005). Obesity in South Africa: challenges for government and health professionals. *Public Health Nutrition*, 8(5), 491-500.
- Kuhn, T. (1962). The Structure of Scientific Revolutions. <https://www.lri.fr/~mbl/Stanford/CS477/papers/Kuhn-SSR-2ndEd.pdf>
- Lake, A., & Townshend, T. (2006). Obesogenic environments: exploring the built and food environments. *The Journal of the Royal Society for the Promotion of Health*, 126(6), 262-267.

- Lambert, B. S., Oliver, J. M., Katts, G. R., Green, J. S., Martin, S. E., & Crouse, S. F. (2012). DEXA or BMI: clinical considerations for evaluating obesity in collegiate division IA American football athletes. *Clinical Journal of Sport Medicine*, 22(5), 436-438.
- Laudenslager, M., Chaudhry, Z. W., Rajagopal, S., Clynes, S., & Gudzone, K. A. (2021). Commercial Weight Loss Programs in the Management of Obesity: an Update. *Current Obesity Reports*, 10(2), 90-99. <https://doi.org/10.1007/s13679-021-00428-y>
- Lee, J. A., & Pausé, C. J. (2016). Stigma in Practice: Barriers to Health for Fat Women [Hypothesis and Theory]. *Frontiers in Psychology*, 7(2063). <https://doi.org/10.3389/fpsyg.2016.02063>
- Les Mills. (2022). *Les Mills Gym*. <https://www.lesmills.co.nz/>
- Lewis-Beck, M., Bryman, A., & Liao, T. (2004). *Interpretivism*. In The SAGE Encyclopaedia of Social Science Research Methods. <https://doi.org/10.4135/9781412950589>
- Lewis, S., Thomas, S. L., Blood, R. W., Castle, D. J., Hyde, J., & Komesaroff, P. A. (2011). How do obese individuals perceive and respond to the different types of obesity stigma that they encounter in their daily lives? A qualitative study. *Social Science & Medicine*, 73(9), 1349-1356.
- Lovejoy, J. C. (1998). The influence of sex hormones on obesity across the female life span. *Journal of Women's Health*, 7(10), 1247-1256.
- Lupton, D. (2013). *Fat politics: Collected writings*. Sydney: University of Sydney. Available at SSRN 2273419.
- Lustig, A. (1991). Weight loss programs: Failing to meet ethical standards? *Journal of the American Dietetic Association*, 91(10), 1252-1254. [https://doi.org/https://doi.org/10.1016/S0002-8223\(21\)01366-3](https://doi.org/https://doi.org/10.1016/S0002-8223(21)01366-3)
- Madigan, C. D., Graham, H. E., Sturgiss, E., Kettle, V. E., Gokal, K., Biddle, G., Taylor, G. M. J., & Daley, A. J. (2022). Effectiveness of weight management interventions for adults delivered in primary care: systematic review and meta-analysis of randomised controlled trials. *BMJ*, 377, e069719. <https://doi.org/10.1136/bmj-2021-069719>
- Magallares, A., Luna, B., Garriga, M., Botella-Carretero, J. I., & Morales, J. F. (2016). Subtle discrimination and subjective well-being in obese patients: The personal/group discrimination discrepancy. *Stigma and Health*, 1(3), 156.
- Magdaleno, R., Chaim, E. A., & Turato, E. R. (2010). Understanding the life experiences of Brazilian women after bariatric surgery: a qualitative study. *Obesity Surgery*, 20(8), 1086-1089.
- Mandle, J., Tugendhaft, A., Michalow, J., & Hofman, K. (2015). Nutrition labelling: A review of research on consumer and industry response in the global South. *Global Health Action*, 8(1), Article 25912. <https://doi.org/10.3402/gha.v8.25912>
- Manokaran, R., Pausé, C., Roßmöller, M., & Vilhjálmsdóttir, T. M. (2021). 'Nothing about us without us': Fat people speak. *Qualitative Research in Psychology*, 18(4), 537-549. <https://doi.org/10.1080/14780887.2020.1780355>
- Maple-Brown, L. J., & Hampton, D. (2020). Indigenous cultures in countries with similar colonisation histories share the challenge of intergenerational diabetes. *The Lancet Global Health*, 8(5), e619-e620.

- Marmot, M. (2017). The health gap: Doctors and the social determinants of health. *Scandinavian Journal of Public Health*, 45(7), 686-693. <https://doi.org/10.1177/1403494817717448>
- Marrone, S. (2007). Understanding barriers to health care: a review of disparities in health care services among indigenous populations. *International Journal of Circumpolar Health*, 66(3), 188-198.
- Martin, D. H. (2012). Two-eyed seeing: a framework for understanding indigenous and non-indigenous approaches to indigenous health research. *Canadian Journal of Nursing Research Archive*, 20-43.
- Mastrocola, M. R., Roque, S. S., Benning, L. V., & Stanford, F. C. (2020). Obesity education in medical schools, residencies, and fellowships throughout the world: a systematic review. *International Journal of Obesity (London)*, 44(2), 269-279. <https://doi.org/10.1038/s41366-019-0453-6>
- Mazza, D., McCarthy, E., Carey, M., Turner, L., & Harris, M. (2019). "90% of the time, it's not just weight": General practitioner and practice staff perspectives regarding the barriers and enablers to obesity guideline implementation. *Obesity Research & Clinical Practice*, 13(4), 398-403. <https://doi.org/https://doi.org/10.1016/j.orcp.2019.04.001>
- Mazza, D., McCarthy, E., Singh, N., Carey, M., Turner, L., & Harris, M. (2020). "There's always something else": Patient perspectives on improving the implementation of obesity guidelines in general practice. *Obesity Research & Clinical Practice*, 14(5), 437-442.
- McClinchy, J., Dickinson, A., Barron, D., & Thomas, H. (2011). Practitioner and lay perspectives of the service provision of nutrition information leaflets in primary care. *Journal of Human Nutrition and Dietetics*, 24(6), 552-559.
- Mello, M. M., Rimm, E. B., & Studdert, D. M. (2003). The McLawsuit: the fast-food industry and legal accountability for obesity. *Health Affairs*, 22(6), 207-216.
- Mercer, C., Riini, D., Hamerton, H., Morrison, L., & McPherson, B. (2013). Evaluating a healthy eating, healthy action program in small Māori communities in Aotearoa, New Zealand. *Australian Journal of Primary Health*, 19(1), 74-80.
- Michie, S. (2007). Talking to primary care patients about weight: a study of GPs and practice nurses in the UK. *Psychology, Health and Medicine*, 12(5), 521-525.
- Ministry of Health. (2002). *Reducing Inequalities in Health*. <https://www.health.govt.nz/publication/reducing-inequalities-health>
- Ministry of Health. (2013). *Annual Report for the year ended 30 June 2013 including the Director-General of Health's Annual Report on the State of Public Health*. <https://www.health.govt.nz/publication/annual-report-year-ended-30-june-2013>
- Ministry of Health. (2015). *Māori health models*. <https://www.health.govt.nz/our-work/populations/maori-health/maori-health-models>
- Ministry of Health. (2017). *Clinical Guidelines for Weight Management in New Zealand Adults*. <https://www.health.govt.nz/publication/clinical-guidelines-weight-management-new-zealand-adults>

- Ministry of Health. (2018a). *Achieving Equity in Health Outcomes: Highlights of selected papers*. <https://www.health.govt.nz/publication/achieving-equity-health-outcomes-highlights-selected-papers>
- Ministry of Health. (2018b). *Measuring Weight*. <https://www.health.govt.nz/your-health/healthy-living/food-activity-and-sleep/healthy-weight/measuring-weight>
- Ministry of Health. (2020). *Eating and Activity Guidelines for New Zealand Adults*. <https://www.health.govt.nz/publication/eating-and-activity-guidelines-new-zealand-adults>
- Ministry of Health. (2021a). *Healthy eating*. <https://www.health.govt.nz/your-health/healthy-living/food-activity-and-sleep/healthy-eating?icn=yh-healthy-eating&ici=readmore>
- Ministry of Health. (2021b). *Obesity Statistics*. <https://www.health.govt.nz/nz-health-statistics/health-statistics-and-data-sets/obesity-statistics>
- Ministry of Health. (2022a). *Healthy Weight BMI Calculator*. <https://www.health.govt.nz/your-health/healthy-living/food-activity-and-sleep/healthy-weight-bmi-calculator>
- Ministry of Health. (2022b). *Obesity*. <https://www.health.govt.nz/our-work/diseases-and-conditions/obesity>
- Ministry of Health. (n.d). *New Zealand Health Survey. Indicator: Visited or talked to GP in past 12 months. Ministry of Health*. https://minhealthnz.shinyapps.io/nz-health-survey-2020-21-annual-data-explorer/_w_6a817f5d/#!/explore-indicators
- Moewaka Barnes, H., & McCreanor, T. (2019). Colonisation, hauora and whenua in Aotearoa. *Journal of the Royal Society of New Zealand*, 49(sup1), 19-33.
- Moher D, L. A., Tetzlaff J, Altman DG, The PRISMA Group. (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. *PLoS Med* 6(7): e1000097.
- Mold, F., & Forbes, A. (2013). Patients' and professionals' experiences and perspectives of obesity in health-care settings: a synthesis of current research. *Health Expectations*, 16(2), 119-142.
- Monsen, K. A., Attleson, I. S., Erickson, K. J., Neely, C., Oftedahl, G., & Thorson, D. R. (2015). Translation of Obesity Practice Guidelines: Interprofessional Perspectives Regarding the Impact of Public Health Nurse System-Level Intervention. *Public Health Nursing*, 32(1), 34-42. <https://doi.org/10.1111/phn.12139>
- Moyer, V. A. (2012). Screening for and management of obesity in adults: US Preventive Services Task Force recommendation statement. *Annals of internal medicine*, 157(5), 373-378.
- Murphy, E., McAuley, K. A., Bell, D., McLay, R. T., Chisholm, A., Hurley, R., Story, G., Mann, J. I., Thomson, R., & Williams, S. M. (2003). A new approach to design and implement a lifestyle intervention programme to prevent type 2 diabetes in New Zealand Māori. *Asia Pacific Journal of Clinical Nutrition*, 12(4).
- Naper, J., Manetto, L., & Wiren, D. (2017, Dec). A project to improve the quality of care for overweight and obese patients in a Nelson general practice. *Journal of Primary Health Care*, 9(4), 321-327. <https://doi.org/10.1071/hc17009>
- National Association to Advance Fat Acceptance. (2020). *NAAFA*. <https://naafa.org/>

- National Health and Medical Research Council. (2013). *Clinical Practice Guidelines for the management of overweight and obesity in adults, adolescents and children in Australia*. <https://www.nhmrc.gov.au/about-us/publications/clinical-practice-guidelines-management-overweight-and-obesity>
- National Health Committee. (2010). *Rural Health Challenges of Distance Opportunities for Innovation*. <http://www.nhc.health.govt.nz>
- National Health Service (Digital). (n.d). *Primary Care*. <https://digital.nhs.uk/data-and-information/areas-of-interest/primary-care>
- National Institute for Health and Care Excellence (NICE). (2014). *Weight management: lifestyle services for overweight or obese adults. Public health guideline [PH53]*. <https://www.nice.org.uk/guidance/ph53>
- NCD Risk Factor Collaboration. (2019). Rising rural body-mass index is the main driver of the global obesity epidemic in adults. *Nature*, 569(7755), 260.
- New Zealand Government. (2022). *Pae Ora (Health Futures) Bill*. <https://legislation.govt.nz/bill/government/2021/0085/latest/LMS575405.html>
- New Zealand Legislation. (2003). *Health Practitioners Competence Assurance Act 2003*. <https://www.legislation.govt.nz/act/public/2003/0048/latest/DLM203312.html>
- New Zealand National Health Survey. (2017). *Obesity Stats NZ*. http://archive.stats.govt.nz/browse_for_stats/snapshots-of-nz/nz-social-indicators/Home/Health/obesity.aspx
- Nguyen, N. H., Subhan, F. B., Williams, K., & Chan, C. B. (2020). Barriers and mitigating strategies to healthcare access in indigenous communities of Canada: a narrative review. *Healthcare*, (Vol. 8, No. 2, p. 112). Multidisciplinary Digital Publishing Institute.
- Nigatu, Y., Reijneveld, S. A., de Jonge, P., van Rossum, E., & Bültmann, U. (2016). The combined effects of obesity, abdominal obesity and major depression/anxiety on health-related quality of life: the lifelines cohort study. *PLoS One*, 11(2).
- Noblit, G. W., & Hare, R. D. (1988). *Meta-ethnography: Synthesizing qualitative studies* (Vol. 11). Sage.
- Nolan, C., Deehan, A., Wylie, A., & Jones, R. (2012). Practice nurses and obesity: professional and practice-based factors affecting role adequacy and role legitimacy. *Primary Health Care Research & Development*, 13(4), 353-363.
- Norman, K., Chepulis, L., Burrows, L., & Lawrenson, R. (2021). Adult obesity management in New Zealand general practice: a review. *Journal of Primary Health Care*.
- Norman, K., Chepulis, L., Campbell, F., Burrows, L., & Lawrenson, R. (2022). Waikato GP perspectives on obesity management in general practice: a short report. *Journal of Primary Health Care*.
- Obesity Canada. (2022). *Canadian Adult Obesity Clinical Practice Guidelines*. <https://obesitycanada.ca/guidelines/chapters/>

- Ogden, J., Bandara, I., Cohen, H., Farmer, D., Hardie, J., Minas, H., Moore, J., Qureshi, S., Walter, F., & Whitehead, M. A. (2001). General practitioners' and patients' models of obesity: whose problem is it? *Patient Education and Counseling*, *44*(3), 227-233.
- Ogden, J., George, C. L., & De La Rey, C. (1992). Fat Chance! The Myth of Dieting Explained. *Agenda*, *8*(15), 87-90. <https://doi.org/10.1080/10130950.1992.9676108>
- Oliver, M., Witten, K., Blakely, T., Parker, K., Badland, H., Schofield, G., Ivory, V., Pearce, J., Mavoa, S., & Hinckson, E. (2015). Neighbourhood built environment associations with body size in adults: mediating effects of activity and sedentariness in a cross-sectional study of New Zealand adults. *BMC Public Health*, *15*(1), 956.
- Organisation for Economic Co-operation and Development (OECD). (2017). *OECD Obesity Update 2017*. OECD: Paris, France. <https://www.oecd.org/health/obesity-update.htm>
- Orser, B. A., Wilson, C. R., & Bainbridge, D. (2021). Improving anesthesia care and pain medicine in rural Canada: nothing about us without us. *Canadian Journal of Anaesthesia/Journal Canadien D'anesthésie*, *68*(12), 1731-1737. <https://doi.org/10.1007/s12630-021-02098-9>
- Ouldzeidoune, N., Keating, J., Bertrand, J., & Rice, J. (2013). A description of female genital mutilation and force-feeding practices in Mauritania: implications for the protection of child rights and health. *PLoS One*, *8*(4).
- Oxford Reference. (2022). *Pragmatism*. <https://www.oxfordreference.com/view/10.1093/oi/authority.20110803100341781>
- Paradies, Y. (2016). Colonisation, racism and indigenous health. *Journal of Population Research*, *33*(1), 83-96.
- Patel, A., Schofield, G. M., Kolt, G. S., & Keogh, J. W. (2011). General practitioners' views and experiences of counselling for physical activity through the New Zealand Green Prescription program. *BMC Family Practice*, *12*, 119. <https://doi.org/10.1186/1471-2296-12-119>
- Patterson, M. C., & Hilton, S. (2013). Normalisation and stigmatisation of obesity in UK newspapers: a visual content analysis. *The Open Obesity Journal*, *5*, 82.
- Pausé, C. (2020). Ray of light: Standpoint theory, fat studies, and a new fat ethics. *Fat Studies*, *9*(2), 175-187.
- Pearce, J., Blakely, T., Witten, K., & Bartie, P. (2007). Neighborhood deprivation and access to fast-food retailing: a national study. *American Journal of Preventive Medicine*, *32*(5), 375-382.
- Pelchat, M. L. (2009). Food addiction in humans. *The Journal of Nutrition*, *139*(3), 620-622.
- Phillips, K., Wood, F., & Kinnersley, P. (2014). Tackling obesity: The challenge of obesity management for practice nurses in primary care. *Family Practice*, *31*(1), 51-59. <https://doi.org/10.1093/fampra/cmt054>
- Pinnacle Incorporated. (2022). *Developing New Roles in General Practice*. <https://www.pinnaclepractices.co.nz/thriving-practices/developing-new-roles/>
- Pollock, N. J. (1995). Cultural elaborations of obesity-fattening practices in Pacific societies. *Asia Pacific Journal of Clinical Nutrition*, *4*, 357-360.
- Prentice, A. M., & Jebb, S. A. (2001). Beyond body mass index. *Obesity Reviews*, *2*(3), 141-147.

- Puhl, R. M., Gold, J. A., Luedicke, J., & DePierre, J. A. (2013). The effect of physicians' body weight on patient attitudes: implications for physician selection, trust and adherence to medical advice. *International Journal of Obesity*, 37(11), 1415-1421. <https://doi.org/10.1038/ijo.2013.33>
- Puhl, R. M., & Heuer, C. A. (2010). Obesity stigma: important considerations for public health. *American Journal of Public Health*, 100(6), 1019-1028.
- Puhl, R. M., Himmelstein, M. S., & Pearl, R. L. (2020). Weight stigma as a psychosocial contributor to obesity. *American Psychologist*, 75(2), 274.
- Rahiri, J. L., Gillon, A., Tuhoe, J., MacCormick, A. D., Hill, A., & Harwood, M. (2020). Māori experiences of bariatric surgery in South Auckland, New Zealand. *AlterNative: An International Journal of Indigenous Peoples*, 16(4), 300-308.
- Rossmann, G. B., & Wilson, B. L. (1985). Numbers and words: Combining quantitative and qualitative methods in a single large-scale evaluation study. *Evaluation Review*, 9(5), 627-643.
- Rothman, K. J. (2008). BMI-related errors in the measurement of obesity. *International Journal of Obesity*, 32(3), S56-S59.
- Royal New Zealand College of General Practitioners. (2023). Division of Rural Hospital Medicine. *Specialise in rural hospital medicine*. <https://www.rnzcgp.org.nz/study-with-us/study-rural-hospital-medicine/>. Ruelaz, A. R., Diefenbach, P., Simon, B., Lanto, A., Arterburn, D., & Shekelle, P. G. (2007). Perceived barriers to weight management in primary care—perspectives of patients and providers. *Journal of General Internal Medicine*, 22(4), 518-522.
- Rural Health Alliance Aotearoa New Zealand. (2019). *RHAANZ Rural Health Road Map*. <https://rhaanz.org.nz/wp-content/uploads/2019/11/Rural-Health-Road-Map-2019.pdf>
- Russell, N., & Carryer, J. (2013). Living large: the experiences of large-bodied women when accessing general practice services. *Journal of Primary Health Care*, 5(3), 199-205.
- Sacks, G., Swinburn, B. A., Cameron, A. J., & Ruskin, G. (2018). How food companies influence evidence and opinion—straight from the horse's mouth. *Critical Public Health*, 28(2), 253-256.
- Salimi, Y., Shahandeh, K., Malekafzali, H., Loori, N., Kheiltash, A., Jamshidi, E., Frouzan, A. S., & Majdzadeh, R. (2012). Is Community-based Participatory Research (CBPR) Useful? A Systematic Review on Papers in a Decade. *International Journal of Preventive Medicine*, 3(6), 386-393.
- Sapaugh, D. K. (2018). Obesity: Care in Rural Communities. *Open Access Library Journal*, 5(5), 1-12.
- Siahpush, M., Huang, T. T. K., Sikora, A., Tibbits, M., Shaikh, R. A., & Singh, G. K. (2014). Prolonged financial stress predicts subsequent obesity: Results from a prospective study of an Australian national sample. *Obesity*, 22(2), 616-621.
- Skipper, R. A. (2012). Obesity: Towards a System of Libertarian Paternalistic Public Health Interventions. *Public Health Ethics*, 5(2), 181-191.
- Sonntag, U., Brink, A., Renneberg, B., Braun, V., & Heintze, C. (2012). GPs' attitudes, objectives and barriers in counselling for obesity—a qualitative study. *The European Journal of General Practice*, 18(1), 9-14.

- Swinburn, B., Egger, G., & Raza, F. (1999). Dissecting obesogenic environments: the development and application of a framework for identifying and prioritizing environmental interventions for obesity. *Preventive Medicine, 29*(6), 563-570.
- Swinburn, B. A., Walter, L. G., Arroll, B., Tilyard, M. W., & Russell, D. G. (1997). Green prescriptions: attitudes and perceptions of general practitioners towards prescribing exercise. *British Journal of General Practice, 47*(422), 567-569.
- Tajfel, H. and Turner, J.C. (1986) The Social Identity Theory of Intergroup Behavior. In: Worchel, S. and Austin, W.G., Eds., *Psychology of Intergroup Relation*, Hall Publishers, Chicago, 7-24.
- Talumaa, B., Brown, A., Batterham, R. L., & Kalea, A. Z. (2022). Effective strategies in ending weight stigma in healthcare. *Obesity Reviews, 23*(10), e13494.
- Tariq, S., & Woodman, J. (2013). Using mixed methods in health research. *JRSM Short Reports, 4*(6), 2042533313479197-2042533313479197.
- Te Morenga, L., Pekepo, C., Corrigan, C., Matoe, L., Mules, R., Goodwin, D., Dymus, J., Tunks, M., Grey, J., Humphrey, G., Jull, A., Whittaker, R., Verbiest, M., Firestone, R., & Ni Mhurchu, C. (2018). Co-designing an mHealth tool in the New Zealand Māori community with a “Kaupapa Māori” approach. *AlterNative: An International Journal of Indigenous Peoples, 14*(1), 90-99.
- Te Whatu Ora Health New Zealand. (2023). *Snapshot of Te Whatu Ora Waikato*. <http://www.waikatodhb.govt.nz/about-us/snapshot-of-waikato-dhb/>
- Teddlie, C., & Tashakkori, A. (2009). *Foundations of mixed methods research: Integrating quantitative and qualitative approaches in the social and behavioral sciences*. Sage.
- Teixeira, F. V., Pais-Ribeiro, J. L., & Maia, A. (2015). A qualitative study of GPs' views towards obesity: Are they fighting or giving up?. *Public Health, 129*(3), 218-225.
- Ten Have, M., De Beaufort, I. D., Teixeira, P., Mackenbach, J., & van der Heide, A. (2011). Ethics and prevention of overweight and obesity: an inventory. *Obesity Reviews, 12*(9), 669-679.
- Tipene-Leach, D. C., Coppell, K. J., Abel, S., Pāhau, H. L., Ehau, T., & Mann, J. I. (2013). Ngāti and healthy: translating diabetes prevention evidence into community action. *Ethnicity & Health, 18*(4), 402-414.
- Tomiyaama, A. J., Carr, D., Granberg, E. M., Major, B., Robinson, E., Sutin, A. R., & Brewis, A. (2018). How and why weight stigma drives the obesity ‘epidemic’ and harms health. *BMC medicine, 16*(1), 1-6.
- Triggs, S., Mason, K., & Borman, B. (2007). *Urban-rural Health Comparisons: Key Results of the 2002/03 New Zealand Health Survey*. Wellington: Ministry of Health.
- Ulijaszek, S. J., & Lofink, H. (2006). Obesity in biocultural perspective. *Annual Review of Anthropology, 35*, 337-360.
- University of Waikato. (2022). *Rural Health*. <https://www.waikato.ac.nz/huataki-waiora-health/research/medical-research-centre/rural-health>

- Van Dillen, S. M., & Hiddink, G. J. (2014). To what extent do primary care practice nurses act as case managers lifestyle counselling regarding weight management? A systematic review. *BMC Family Practice, 15*(1), 1-9.
- Van Strien, T. (2018). Causes of emotional eating and matched treatment of obesity. *Current Diabetes Reports, 18*(6), 35.
- Verbiest, M. E. A., Corrigan, C., Dalhousie, S., Firestone, R., Funaki, T., Goodwin, D., Grey, J., Henry, A., Humphrey, G., Jull, A., Vano, M., Pekepo, C., Morenga, L. T., Whittaker, R., & Mhurchu, C. N. (2018). Using codesign to develop a culturally tailored, behavior change mHealth intervention for indigenous and other priority communities: A case study in New Zealand. *Translational Behavioral Medicine, 9*(4), 720-736.
- Volkow, N. D., Wang, G. J., Tomasi, D., & Baler, R. D. (2013). Obesity and addiction: neurobiological overlaps. *Obesity Reviews, 14*(1), 2-18.
- Wallace, D., Myles, P., Holt, R., & Van-Tam, J. N. (2016). Evaluation of the 'Live Life Better Service', a community-based weight management service, for morbidly obese patients. *Journal of Public Health, 38*(2), e138-e149.
- Wang, Y. C., McPherson, K., Marsh, T., Gortmaker, S. L., & Brown, M. (2011). Health and economic burden of the projected obesity trends in the USA and the UK. *The Lancet, 378*(9793), 815-825.
- Warbrick, I., Came, H., & Dickson, A. (2019). The shame of fat shaming in public health: moving past racism to embrace indigenous solutions. *Public Health, 176*, 128-132.
- Weight Watchers. (2022). *WW Weight Watchers*. <https://www.weightwatchers.com>
- Wikaire, E., Harwood, M., & Pihama, L. (2018). Rongoā Māori: Traditional Māori health systems. What was, is and will be? *PRIDoC Pacific Region Indigenous Doctors Congress*.
- Williams, M. (2016a). *Epistemology*. In Key Concepts in the Philosophy of Social Research. SAGE Publications Ltd. <https://doi.org/10.4135/9781473982758>
- Williams, M. (2016b). *Ontology*. In Key Concepts in the Philosophy of Social Research. SAGE Publications Ltd. <https://doi.org/10.4135/9781473982758>
- Williams, M. (2016c). *Positivism*. In Key Concepts in the Philosophy of Social Research. SAGE Publications Ltd. <https://doi.org/10.4135/9781473982758>
- Woodruff, R. C., Schauer, G. L., Addison, A. R., Gehlot, A., & Kegler, M. C. (2016). Barriers to weight loss among community health center patients: qualitative insights from primary care providers. *BMC Obesity, 3*(1), 43.
- World Health Organization. (2018). *Health inequities and their causes*. <https://www.who.int/news-room/facts-in-pictures/detail/health-inequities-and-their-causes>
- World Health Organization. (2021a). *Obesity*. <https://www.who.int/topics/obesity/en/>
- World Health Organization. (2021b). *Obesity and Overweight*. <https://www.who.int/en/news-room/fact-sheets/detail/obesity-and-overweight>
- World Health Organization. (2022). *Social Determinants of Health*. https://www.who.int/health-topics/social-determinants-of-health#tab=tab_2

- Young, J., & Burrows, L. (2013). Finding the 'self' after weight loss surgery: Two women's experiences. *Feminism & Psychology, 23*(4), 498-516.
- Zhao, G., Ford, E. S., Dhingra, S., Li, C., Strine, T. W., & Mokdad, A. (2009). Depression and anxiety among US adults: associations with body mass index. *International Journal of Obesity, 33*(2), 257-266.

Appendix A: Co-Authorship Forms



Co-Authorship Form

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Chapter 3/ Article 1: Adult obesity management in New Zealand general practice: a review
Reference: Norman, K., Chepulis, L., Burrows, L., & Lawrenson, R. (2021). Adult obesity management in New Zealand general practice: a review. *Journal of Primary Health Care*.

Nature of contribution by PhD candidate	Research design, data collection and analysis, write up and dissemination of work
Extent of contribution by PhD candidate (%)	90%

CO-AUTHORS

Name	Nature of Contribution
Lynne Chepulis	Guidance on design, data collection, analysis, and feedback for write up of paper
Lisette Burrows	Guidance on design, data collection, analysis, and feedback for write up of paper
Ross Lawrenson	Guidance on design, data collection, analysis, and feedback for write up of paper

Certification by Co-Authors

The undersigned hereby certify that:

- the above statement correctly reflects the nature and extent of the PhD candidate's contribution to this work, and the nature of the contribution of each of the co-authors; and

Name	Signature	Date
Kimberley Norman		16/01/23
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Chapter 4 / Article 2 - Publication Reference: Norman, K., Chepulis, L., Burrows, L., & Lawrenson, R. (2022). Barriers to obesity health care from GP and client perspectives in New Zealand general practice: A meta-ethnography review. *Obesity Reviews*, 23(10), e13495.

Nature of contribution by PhD candidate	Research design, data collection and analysis, write up and dissemination of work
Extent of contribution by PhD candidate (%)	90%

CO-AUTHORS

Name	Nature of Contribution
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Ross Lawrenson	Guidance on design, data collection, analysis, and feedback for write up of paper

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Chapter 5 / Article 3- Publication Reference: Norman, K., Chapuis, L., Campbell, F., Burrows, L., & Lawrenson, R. (2022). Waikato GP perspectives on obesity management in general practice: a short report. *Journal of Primary Health Care*.

Nature of contribution by PhD candidate: Research design, data collection and analysis, write up and dissemination of work

Extent of contribution by PhD candidate (%): 90%

CO-AUTHORS

Name	Nature of Contribution
Lynne Chapuis	Guidance with survey question design, data collection, analysis, feedback for write up
Fiona Campbell	Assistance with survey questions, data collection and feedback for write up
Lisette Burrows	Guidance with design, data collection, analysis, feedback for write up
Ross Lawrenson	Assistance survey questions, data collection, analysis, feedback for write up

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Chapter 6/ Article 4: Title: Barriers to Obesity Healthcare in Rural General Practice from rural Waikato GP perspectives: a qualitative study. Authors Norman K, Chepulis L, Burrows L, Lawrenson R. (2022)
 Status: Submitted to Australian Journal of Rural Health.

Nature of contribution by PhD candidate	Research design, data collection and analysis, write up and dissemination of work
Extent of contribution by PhD candidate (%)	90%

CO-AUTHORS

Name	Nature of Contribution
Lynne Chepulis	Guidance with interview questions, data collection, analysis, feedback for write up
Lisette Burrows	Guidance with interview questions, data collection, analysis, feedback for write up
Ross Lawrenson	Guidance with interview questions, data collection, analysis, feedback for write up

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Chapter 7/ Article 5-Title:Obesity Management in General Practice: A Qualitative Exploration of the Rural Nurse Perspective. Authors Norman K, Chapulis L, Burrows L, Mullins H, and Lawrenson R. (2022)
Status: Submitted to Primary Health Care Research & Development Journal

Nature of contribution
by PhD candidate

Research design, data collection and analysis, write up and dissemination of work

Extent of contribution
by PhD candidate (%)

90%

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Hilda Mullins	Assistance with interview questions and feedback for write up
Ross Lawrenson	Guidance with interview questions, data collection, analysis, feedback for write up

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Chapter 8/ Article 6- Published: Norman, K., Burrows, L., Chepulis, L., & Lawrenson, R. (2022). "Sometimes choices are not made, because we have 'a' choice, they're made because they are 'the' choice": Barriers to weight management for clients in rural general practice. *BMC Primary Care*, 23(1), 1-9.

Nature of contribution by PhD candidate	Research design, data collection and analysis, write up and dissemination of work
Extent of contribution by PhD candidate (%)	90%

CO-AUTHORS

Name	Nature of Contribution
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Ross Lawrenson	Guidance with interview process, data collection, analysis, feedback for write up

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Chapter 9/ Article 7: Understanding Weight Management Experiences from Patient Perspectives: Qualitative Exploration in General Practice. Authors Norman K, Burrows L, Chepulis L, Keenan R, Lawrenson R. (2022)
Status: In review with BMC Primary Care

Nature of contribution by PhD candidate

Research design, data collection and analysis, write up and dissemination of work

Extent of contribution by PhD candidate (%)

90%

CO-AUTHORS

Name	Nature of Contribution
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Lynne Chepulis	Guidance with interview questions, data collection, analysis, feedback for write up
Rawiri Keenan	Guidance with interview questions, data collection, analysis, feedback for write up
Ross Lawrenson	Guidance with interview questions, data collection, analysis, feedback for write up

Certification by Co-Authors

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Appendix B- Qualitative Interview Guides

Obesity Healthcare Barriers Interview Guide: GENERAL PRACTITIONER

Introduction - Whanaungatanga

- Thank participant for their time and agreeing to participate
- Ask about karakia or culturally appropriate opening to interview
- Introduce self/background including where you're from
- Respond to participant's own introduction
- Answer questions about yourself
- Ask if it's OK to start the interview

Recap of Research Aims

- Explain aims of research and interview
- Verbally go through participant information sheet, and answer any questions/clarify any doubts
- Give participant information sheet and consent form
- Gain audio recorded consent for turning Dictaphone on

Basic Overview of the Interview

1. Please tell me about your experience with delivering obesity and weight management in your practice?
2. From your experience and perspective, how effective / non-effective are the processes you use? Why?
3. Please tell me about your experience with treating patients for excess weight and obesity health issues, such as what treatment or intervention options do you use?
4. From your experience and perspective, how effective/ non- effective are the treatment options for your patients? Why?
5. From your perspective, please tell me about your experiences with raising, discussing and delivering weight management in your practice?
6. From your perspective, what do you think the main contributors to obesity health concerns are with your overweight/ obese clients?
7. From your perspective, is there anything you feel could be beneficial in your role when delivering excess weight and obesity healthcare to your patients?

End of Interview

- Ask the participant if they would like to share/ add anything more to their experience
- Thank participant for their time and answer any further questions

- Ask the participant if they would like to close using a culturally appropriate action.

Reminder

Address/contact details to send through summary report of research - if required

Obesity Healthcare Barriers Interview Guide: COMMUNITY MEMBERS

Introduction - Whanaungatanga

- Thank participant for their time and agreeing to participate
- Ask about karakia or culturally appropriate opening of interview
- Introduce self/background including where you're from
- Respond to participant's own introduction
- Answer questions about yourself
- Ask if it's OK to start the interview

Recap of Research Aims

- Explain aims of research and interview
- Verbally go through participant information sheet, and answer any questions/clarify any doubts
- Give participant information sheet and consent form
- Gain audio recorded consent for turning Dictaphone on

Basic Overview of the Interview

For the Rural Community Member Participant

1. Please tell me about your experience with 'excess' weight management or obesity health concerns?
2. Why did you choose this option?
3. Please tell me about your experience with obesity healthcare (relative to applicable weight management strategy used) when you visited your GP or primary healthcare professional?
4. From your perspective, please tell me about any difficulties or barriers you faced with your weight management strategy? (Issues with culture/cost/ accessibility/ geographical location/ psychosocial?)
5. From your experiences and perspective, please tell me about what you think the main contributors to obesity or weight difficulties are in rural communities?
6. From your perspective, what do feel would be useful / effective for you, your whanau, and your wider rural community to improve obesity or weight related healthcare?

End of Interview

- Ask the participant if they would like to share/ add anything more to their experience or narrative
- Thank participant for their time and answer any further questions
- Ask the participant if they would like to close with a karakia or culturally appropriate closing.

Reminder

Address/contact details to send through summary report of research - if required
