Effective implementation science processes for Māori and Indigenous health interventions

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Abstract

Background

This thesis considers the implications implementation science has for Indigenous communities, specifically in reducing health inequities for the Māori community of New Zealand. Implementation science has been discussed among many Western health interventions and this thesis adds to that body of literature while highlighting the impact implementation has for Indigenous communities.

Implementation science is a growing body of literature that can identify the most effective processes for health organisations and governments to best engage with Indigenous communities facing health inequities. An important aspect of that is ensuring the Indigenous voices and perspectives are represented just as much as the academics and scholars in those fields. The purpose of this thesis is to highlight the facilitators and barriers of implementing health interventions with Māori communities in Aotearoa New Zealand. This thesis aims to contribute to the conversation about reducing health inequities Māori communities' face in New Zealand by enhancing implementation effectiveness. Therefore, it is an effort to illuminate the importance of the inclusion of community voice and perspectives when implementing health interventions with Indigenous communities. The thesis is with publications and includes four distinct studies.

Methodology & Methods

The key methodologies used in this study were Kaupapa Māori methodology and the He Pikinga Waiora (HPW) Implementation framework. Kaupapa Māori has been used as both a form of resistance and a methodological strategy, where research is created, developed, and carried within a Māori worldview with the aim to have positive outcomes that are beneficial for Māori. The HPW framework provided a holistic approach to guide this research through its key elements of: culture-centered approach, community engagement, systems thinking, and integrated knowledge translation. It is a forward-thinking approach as it is flexible in its design, which allows the framework to be tailored to a variety of implementation situations. The framework is centred in Kaupapa Māori methodology. Each principle of Kaupapa Māori and each element of HPW provide a holistic approach to implementation science.

Given this thesis includes four publications, a range of methods were employed for data collection. The first study was a systematic review of studies that was completed using preferred reporting items for systematic reviews and meta-analysis (PRISMA) guidelines. This involved a stringent search strategy and inclusion criteria where studies included went through data extraction and methodological appraisal followed by an analysis through a qualitative synthesis of findings. Studies two and three employed semi-structured interviews that were analysed through thematic analysis. Study two included 19 participants who were either health professionals or researchers, and study three included 17 participants who were health professionals. The fourth study included an online cross-sectional survey of 200 health professionals and used statistical modelling to identify factors important for implementation effectiveness.

Results

The first study included a systematic literature review to examine the implementation of a non-communicable disease health intervention for Indigenous communities using HPW as an evaluation tool. Twenty-one studies were included. Two thirds of these studies demonstrated high levels of community engagement and community voice/ agency, while 40% had individual-level outcomes with some systems thinking, and 33% included individual-level outcomes and limited systems thinking. Finally, almost 40% of studies included high levels of end-user engagement reflective of integrated knowledge translation, but nearly half had limited end-user engagement with the remaining neither high or low. This study found that the HPW Implementation Framework is a comprehensive model for understanding implementation effectiveness in Indigenous communities and highlighted the high levels of community engagement and community voice. It also brings to light that the long-term sustainability and translation of evidence to practice may be inhibited because of lower levels of systems thinking and integrated knowledge translation.

The second study researched the perceptions health professionals have on co-designing health-promotion interventions with Indigenous communities in New Zealand. Co-designing health-promotion interventions with Indigenous communities presents many benefits and challenges. This study identified that the facilitators for co-designing health-promotion interventions with Māori communities were collaboration and community voice. Furthermore, the two key barriers identified were mismanaged expectations between the researcher and community and the research constraints placed by funding agencies. The findings support the

development of more effective co-design health-promotion interventions within Māori communities which may address health inequities.

The third study endeavoured to identify the facilitators and barriers in disseminating and adopting a health intervention developed by a community-academic partnership. This study explored general perceptions of the implementation process and also included a case study of an innovative intervention. The facilitators included community engagement, programme structure, programme adaptability and creators' experience. The barriers consisted of funding access, funding constraints and organisational constraints. This study also highlights the importance of community engagement and adaptability suggesting a need for translation as well as diffusion. Additionally, this study identified nuanced aspects of funding and resources for organisations that constrain organisations in employing health interventions designed by others.

The final study identified factors that New Zealand health professionals rate as important for implementation effectiveness for health interventions with Māori communities. This study provided a unique perspective of health professionals on implementation effectiveness when working with Māori/Indigenous communities. Paired sample t-tests revealed four levels of importance for implementation effectiveness with organisational teamwork and community autonomy as most important. Only 24% of participants had prior experience with a previous health intervention with Māori communities. The two key overall factors that were associated with participants' rating of implementation effectiveness in these previous interventions were process and community. This study identified the key areas of implementation effectiveness as community engagement and participatory process. Furthermore, the final study contributes to the body of literature that challenges traditional top-down approaches of implementation.

Conclusion

This research aimed to identify the facilitators and barriers to disseminating and implementing health interventions with Māori communities in New Zealand. A synthesis of the four studies provided four key themes for this thesis. This thesis reinforces the position that Indigenous and Māori implementation science should be focused on the process and community engagement. In doing so, community engagement ensures a cultural-centred approach that prioritises Indigenous knowledge and autonomy in the process of

implementation. Furthermore, the barriers identified in this thesis recognise the challenges that remain in limited funding for translating research into implementation practice and managing expectations amongst the implementation team. This thesis has implications for New Zealand district health boards and health organisations who are wanting to increase the effectiveness of the health interventions they are implementing with Māori communities, particularly when trying to address health inequities. Overall, this study is an attempt to bridge the gap between translating research and the processes of putting it into practice.

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"Unuhia te rito o te harakeke, kei hea te kōmako e kō?

Whakatairangitia – rere ki uta, rere ki tai;

Ui mai ki ahau he aha te mea nui o te ao?

Māku e kī atu,

he tangata, he tangata, he tangata"

"If you should tear out the heart of the flax bush, where will the bellbird be?

Will it fly in land, fly out to sea, or fly around aimlessly?

But if you should ask me what is the greatest thing on Earth?

I will tell you, it is people, it is people, it is people"

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PREFACE

Years ago, I had not envisioned myself to be an academic delving into the realm of research and thoroughly enjoying it. Actually, when I was first offered a PhD scholarship I turned it down because I didn't believe it was the path for me. A big part of that was I didn't think I was 'smart' enough to do it, and the other part was I really wanted to travel and see the world. But only a fool turns down the same opportunity twice so when the PhD scholarship presented itself again I figured "well the world will always be there...what's another three or four years". Māori health became a passion for me when I began to be exposed to all the negative statistics and experiences Māori were having. Coming from a large Māori family, I wanted to use the skills I had gained to help them and the wider people of our communities to become more than a statistic and live long and healthy lives. I know that dying is a natural part of life, but I don't like knowing that Māori are dying unavoidable health related deaths. As well as whānau motivation Māori academics inspire me to conduct meaningful research for our people, so that it may have positive outcomes for us all. Many Māori academics are now encouraging up and coming graduates to consider post graduate studies in a field that creates opportunities for other Māori people and communities. The challenge they lay before us is "if not us, then who?" I liked that challenge, it was another thing that kept me going when the PhD got boring, hard, frustrating, and depressing. I hope that when you read this thesis you know that it's not just another thesis; it is an extension of me as a person, it is my beliefs, my culture, and my academic journey all in one.

Thesis –Related Research Outputs

Chapter 3 - Published Journal Article

Harding, T., & Oetzel, J. (2019). Implementation effectiveness of health interventions for indigenous communities: a systematic review. *Implementation Science, 14*(1), 76. https://doi.org/10.1186/s13012-019-0920-4

Chapter 4 - Published Journal Article

Harding, T., Oetzel, J. G., Foote, J., & Hepi, M. (2020). Perceptions of co-designing health promotion interventions with Indigenous communities in New Zealand. *Health Promotion International* https://doi.org/10.1093/heapro/daaa128

Chapter 5 – Under second review at Health Education and Behavor

Identifying the facilitators and barriers in disseminating and adopting a health intervention developed by a community-academic partnership. By Harding, T., Oetzel, J. G., Simpson, M., & Nock, S

Chapter 6 - Published Journal Article

Harding T., & Oetzel J. (2021). Implementation effectiveness of health interventions with Māori communities: a cross-sectional survey of health professionals perspectives. *Australia and New Zealand Journal of Public Health.* Online; doi:10.1111/1753-6405.13093

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Chapter 1: Introduction

Health equity is a significant concern in Aotearoa (New Zealand) with attention and resources from the government, health system and healthcare workers dedicated to enhancing it. In fact, New Zealand has been identified as a leading country in evaluating the effectiveness of health communication strategies to reduce inequities (Bramley et al., 2005). Allowing health inequities to persist is unjust as they are health differences that are preventable and unnecessary (Arcaya et al., 2015). As a result, there is an increasing focus in New Zealand and worldwide to address health inequities faced by many Indigenous peoples (Ageing Well NSC, n.d; Healthier Lives NSC, 2016). For example, the mission-led National Science Challenges (NSC) (Ministry of Business, Innovation & Employment, n.d) particularly those focused on health and wellbeing, have a stated goal of reducing the burden of health inequities faced by Māori (Indigenous people of New Zealand) and Pacifica (Ageing Well NSC, n.d; Healthier Lives NSC, 2016). Researchers associated with these challenges, as well as others worldwide (e.g., World Science Forum, Grand Challenges in Global Health) seek to develop interventions to address these health inequities. Subsequently, many interventions have been developed that have improved the health of Māori and other Indigenous peoples; however, little has been accomplished in terms of sustaining those health gains or achieving gains on a larger scale (Rowan et al., 2014).

The lack of significant and sustainable health gains from those interventions has resulted in more research focused on the implementation process as well as the creation of the intervention (Layne et al., 2008; Oetzel et al., 2015; Rowan et al., 2014). The rationale is that the creation of new interventions in and of themselves does not appear to address health equity and that the implementation process may hold the answer for equity gains (Layne et al., 2008; Oetzel et al., 2015; Rowan et al., 2014). Therefore, implementation principles, research, and sciences are being further examined to analyse their impact on improving health equity for Indigenous communities. Implementation in the health context has been described as "any deliberately initiated attempt to introduce new, or modify existing, patterns of action in health care or some other formal organisational setting." (May et al., 2016, p. 3). This definition demonstrates that when health interventions are implemented they are often institutionally approved, formally defined, consciously planned, and intended to lead to a changed health outcome (May et al., 2016).

In order to gain a full understanding of implementation in the health context it is important to discuss implementation research and implementation science. Implementation research seeks to understand the elements that are associated with successfully integrating interventions within a certain environment (Rabin et al., 2008; Sussman et al., 2006). More specifically, implementation research looks at the core processes and components of an original intervention and includes those as the fundamentals that need to be incorporated to achieve maximum productivity (Khoury et al., 2007). Such core components may include any aspect of the implementation process including socio-cultural characteristics, the results, the evaluation, and potential implications for the scaling up and sustainability of health interventions (Peters et al., 2013). The implementation outcomes that are commonly discussed in implementation research are acceptability, adoption, appropriateness, feasibility, fidelity, cost, coverage, and sustainability (Fixsen et al., 2009; Peters et al., 2013). Achieving such outcomes helps to enhance the effectiveness of an intervention with a target audience.

While implementation research seeks to understand implementation elements, implementation science studies the methods to promote the systematic uptake of research findings into routine practice to improve the quality and effectiveness of health services and care (Nilsen, 2015). The implementation science behind health interventions is a complex process. It involves three key components that must include a wide range of multi-level variables: a) the innovation itself; b) the local implementation context; and c) the behavioural strategies used to implement the innovation (Chaudoir et al., 2013). The implementation context should include the chosen community and the complexities that come with their social normalities (Haines et al., 2004). The context is a complex process as it helps to shape the intervention itself to ensure it is relevant to the study and the community. Another aspect to examine is the state of the community as the community may not be ready for the intervention which could affect the adoption rates (Haines et al., 2004).

Implementation science has been discussed among many Western health interventions and this study adds to that body of literature for Indigenous communities. This study contributes to the current research that identifies the most effective processes for health organisations and governments to best engage with Indigenous communities facing health inequities. An important aspect of that is ensuring the Indigenous voices and perspectives are represented just as much as the academics and scholars in the implementation process. This thesis examines the facilitators and barriers of implementing health interventions for Indigenous communities; specifically, the Māori community. Therefore, this chapter comprises

three key topics that contextualise the background of the thesis. Part One considers the health context of New Zealand; it is important to first discuss the current state of health equity in New Zealand to understand the rationale for this study. Part Two discusses implementation science theories that are commonly used to facilitate implementation of health interventions in an effort to improve health outcomes. Finally, Part Three provides a summary model of the previous two sections and introduces the purpose of the thesis and a brief overview of the chapters to follow.

1.1   The New Zealand Health Context

This section provides insight into the current status of health equity in New Zealand and the inequities between the Indigenous and non-Indigenous populations, particularly as influenced by social determinants. This section also discusses the unique models Māori have designed to understand health from a Māori perspective and to remove barriers for Māori to access better health care in order reduce health equities. Finally, this section considers evidenced-based and culturally adapted (or community-based) interventions to achieve Indigenous health equity.

1.1.1   Health Equity of Aotearoa

The goal of health equity is to ensure that no one is denied the right to be healthy, especially those who have suffered historical economic/social disadvantages (Whitehead & Dahlgren, 2006). Ultimately, it is a commitment to reduce and (eventually) eliminate disparities in health and their determinants (Braveman, 2014). Unfortunately for many Indigenous communities there are many health inequities. Margaret Whitehead in the United Kingdom developed a clear definition of health inequities as health differences that are avoidable, unnecessary and unjust (Whitehead, 1991). These differences include age, gender, socioeconomic position, ethnicity, impairment and geographical region (Reid & Robson, 2000). Health inequities are used to track the progress of achieving health equity (Braveman, 2014; Whitehead & Dahlgren, 2006). When there is an increase or a decrease in health inequities it is an indication that we are moving towards or away from health equity. Therefore, success in health equity looks like the highest possible standard of health for all people, whilst acknowledging and paying special attention to the needs of those who are at greater risk of poor health (Braveman, 2014).

In New Zealand, those who are known for having the greatest inequities are Māori. Māori are the Indigenous people of New Zealand and were once the dominating race in New Zealand. In 1800, Māori had an estimated population of 150,000 (Kingi, 2007). However, by 1890 the population saw a decline to just 42,000 (census). Today the Māori population is only roughly 15% of the entire population (Simmons et al., 2020) and yet there are a numerous negative health statistics about Māori. For example, Māori are less likely than non-Māori to have visited a general practitioner (GP) in the last 12 months (Ministry of Health, 2015). Māori are also more likely to have one or more needs unmet by health care services and report unmet needs due to being unable to book an appointment with the local GP (Ministry of Health, 2015). In addition, costs impact on the Māori community as it has been identified as a barrier to receiving after-hours health services (Ministry of Health, 2015). Between 2007 and 2018 non-Māori experienced potentially avoidable hospitalisations at a consistently lower rate, experienced consistently lower rates of death and lower mortality rates within 30 days of undergoing surgery compared to Māori (Simmons et al., 2020). Although death rates have decreased for both non-Māori and Māori during this time the gap has only improved slightly (from a 9-year to 7-year gap). Therefore, while some health gains have been achieved, there is still a large gap between Māori and non-Māori health statistics. The greatest inequity was identified in deaths from diabetes, with non-Māori dying five times less frequently than Māori. Substantial inequities were also observed in deaths from circulatory and respiratory conditions with non-Māori dying at approximately 40% the rate of Māori (Simmons et al., 2020).

These health statistics are common in many other Indigenous communities and Dodson (2005) puts it frankly by stating that the statistics of shortened life expectancy represent the Indigenous mothers, fathers, uncles, aunties and elders who lived diminished lives and died before their knowledge and stories were passed on. Dodson (2005) reminds everyone to look past the number to see the person and the life lost because of the unavoidable health inequities they have faced. It is crucial for those working in the health system in New Zealand to understand the health inequities Māori face in order to improve the negative health statistics and remove the health inequities this population faces to save Indigenous lives. The next section discusses the social determinants that play a large role in the health inequities Māori face.

1.1.2 Social determinants and Health Equity

Social determinants are the environmental conditions that shape people's health such as socioeconomic status, education, physical environment and employment and are key contributors to health inequities (World Health Organisation, 2021). Colonisation has impacted on the social determinants for Indigenous communities through poverty, marginalisation and the overwhelming contributions to diseases and lower life expectancies (Axelsson et al., 2016). The social determinants many Indigenous peoples face are deeply rooted in the loss of their autonomy over lands and culture (Axelsson et al., 2016). The dominating manner of colonisation ignores and discredits Indigenous customs, principles and approaches to health (Griffiths et al., 2016). This negligence has profoundly impacted on generations of Indigenous peoples causing intergenerational trauma. Intergenerational trauma has been described as the process of parents with unresolved trauma sharing this with their children through specific interactions and behaviours, resulting in the children feeling the trauma without having experienced it themselves (Isobel et al., 2019). The consequences of colonisation still exist today for Indigenous communities; racism, prejudice, stress, depression and violence have all been identified as contributing factors in the ongoing impact of trauma (Griffiths et al., 2016).

Racism, income, access to health care, and rural settings are the social determinants that are most commonly discussed with Indigenous communities (Robson & Harris, 2007). Racism within New Zealand is recognised as an important social determinant of health as there are many forms that can affect health in different ways (e.g., prejudice and treated unfairly) (Robson & Harris, 2007). There is evidence showing a direct link between interpersonal racial discrimination and poorer health outcomes (Robson & Harris, 2007). Another social determinant with well-established connection to health is income. In general, those with lower incomes tend to have higher morbidity and mortality rates in illnesses and injuries (Robson & Harris, 2007). Access to health care is also a frequently discussed social determinant that refers to the specific circumstances that limit/affects the use of the health care services. These include the availability of healthcare providers, long wait lists, limited access to preventable services and transport (Horrill et al., 2018). Finally, one of the social determinants most prevalent in Indigenous communities is living in rural settings. Living rurally has a clear association with mortality and morbidity in New Zealand. The proportion of Māori living in very deprived areas is significantly higher than non-Māori, with over half of the Māori population represented in the most deprived deciles (Horrill et al., 2018). This social determinant also includes access to

health care and income as rural communities tend to be isolated from those services. In New Zealand, racism, income, access to health care, and rural settings are just a few of the social determinants that create the health inequities Māori face in New Zealand.

Understanding that social determinants create health inequities helps to raise awareness on the struggles Indigenous communities face in achieving health equity. The struggle to achieve health equity can be associated to the institutional racism and prejudice within the governance they are faced with that was created through colonisation (Griffiths et al., 2016). Social injustices associated with colonisation must be recognised and addressed in order to make progress is addressing these social determinants. One example of this is the work of Vickery et al., (2007) who challenge the narrative of health determinants to encourage a more positive outlook on social determinants. They identified the decolonisation of social determinants as a recognition of the connection Indigenous communities have to the land and the reconciliation that needs to occur between Indigenous and non-Indigenous communities (Vickery et al., 2007). Prior to colonisation many Indigenous communities had strong connections to their lands that sustained and tended to their health needs (Kingi, 2007). Decolonisation is just one example of how changing the narrative associated to the social determinants can have a positive impact for Indigenous communities

In New Zealand, as noted earlier, Māori were once the dominant population. However due to several events and eras including migration, illness, and colonisation they now make up only 15% of the current population in New Zealand (Statistics New Zealand, 2018). The challenging health statistics and colonial history resulted in the establishment of Indigenous health providers to deliver a uniquely Indigenous approach to health and address the social determinants associated to the health inequities. In the 1990s, after a restructure of the health system, contract opportunities opened for Māori health providers (MHP) which lead to the increase of such providers to 240 throughout the country by 2004 (King, 2000). The types of services delivered by Māori health providers include child health, oral health, maternity, community health, specialist medicine, mental health, health of older people and public health (Waitangi Tribunal, 2019). Regardless of the size of the MHP the unique factor of these organisations is the inclusion of cultural and community-based groups with Māori defined frameworks for understanding health and delivering the health care to their communities (Crengle 1999; Gibson et al., 2005). This is reflected in the majority of their contracts as the services they provide are targeted towards Māori and high-need communities.

In 2020, there were 75 MHP registered to the Ministry of Health operating across the country (Waitangi Tribunal, 2019). Since the establishment of MHP they have had to face many challenges such as defining enrolment criteria (who is allowed to access the services), in some cases the capacity to function without front-line medical staff, underfunded relative to mainstream, and the capacity to provide the required range of services without jeopardising their autonomy and funding (Gibson et al., 2005). However, regardless of these challenges many MHP have been able to transition and maintain their strong positions in their communities alongside other health care providers. An imperative aspect that influences the MHP are the models and frameworks that provide fundamental guidelines for the organisation. The next section discusses well-known Māori health models that have been used to-date; Te Whare Tapa Whā, Meihana Model, Te Pae Mahutonga, and Te Wheke.

1.1.3   Māori Health Models

The way in which Māori view health is heavily influenced by their traditions or tikanga (Mead, 2016). Tikanga includes rules, plans, methods, customs and habits. In legislation it is defined as customary values and practices (Mead, 2016). Tikanga for Māori is used as a guideline that shapes an individual's identity. It ensures that individuals' relationships, communication, and overall life is formed within a Māori world view and is creating a better pathway for one to follow to live a healthy and full life (Mead, 2016). This healthy life is not only physical, it is also emotional, spiritual and social. Descriptions of a Māori view of health are holistic and centred on the collectives' health and wellbeing rather than the health of the individual (Murchie, 1984). These tikanga are key features that should be considered when implementing health interventions.

As research shows, Māori are a unique culture that have their own traditions that influence their daily lives (Durie, 2003). When tikanga is disregarded by health professionals and the health system, Māori disengage with the health sector and remove themselves from environments that ignore their values and practices (Durie, 2003). In a recent report conducted by the Medical Council of New Zealand, many Māori families expressed that they felt disempowered that their knowledge in their culture is underestimated and that it is not included in the decision making (Durie, 2003; Simmons et al., 2020). As a result, these families felt distanced from the health professional and the healthcare services which led to families no longer engaging with those services.

For Māori there have been many attempts at developing a health framework that enables a partnership between researchers and the community to ensure whānau (extended family) voices are heard and listened to by the health sector (Jones et al., 2010). One of the most prominent models is Te Whare Tapa Whā (WTW). WTW provides a holistic view that aligns with the tikanga of Māori culture, and all health aspects (Durie, 1994). The four sides of the wharenui (community meeting house) represent the different aspects of health: te taha wairua (spiritual), te taha hinengaro (psychological), the taha tinana (physical), and te taha whānau (social) (Durie, 1994; Rochford, 2004). The interdependent relationship between each aspect creates a holistic approach. To achieve good health Māori believe that these four walls must be balanced and in harmony with each other (Barton & Wilson, 2008). This narrative has historically been formed by Māori and has, in turn, informed Māori to develop an understanding of what promotes and what underpins good health and wellbeing (Cram et al., 2003).

The Meihana Model is a framework that is an extension of WTW that considers both the clinical and cultural principles to cater to the mental health services for Māori (Pitama et al., 2007). The inclusion of the Meihana Model in mental health highlights the importance of engaging appropriate processes and interventions for Māori communities. This model is designed to be used from the first contact with the patient/whānau and aims to provide a more inclusive environment that considers how the client's presenting issues fit within the context (Pihama et al., 2007). The Meihana Model has six key principles to be utilised as an assessment tool for the clinician to evaluate their own strengths and abilities when working with the diverse needs of the patient and their whānau. The first principle is whānau (support networks). Whānau play a key role in health assessment and monitoring processes; they are able to provide more context on what is impacting the individual. Tinana (physical well-being) refers to the inclusion of the physical well-being and its impact on the individual's overall health. Hinengaro (mental) ensures the evaluation of the presenting behaviours an individual may have includes the cultural aspects and measures used to provide supporting context. This identifies the impact of internal aspects of the individual in relation to cultural context. Wairua (psychological practice) considers the individual's connectedness to people, things, places, and spiritual values that may impact on their behaviour. Taiao (physical environment) considers the physical environment the individuals assessment takes place; is it accessible and culturally safe? The last principle is Iwi-Katoa (societal structures). This principle identifies the organisational strengths and weaknesses to work effectively with Māori communities. Iwi-Katoa focusses on

the extent to which societal expectations, beliefs, and perceptions impact on the health and well-being of the individual. All of these principles rely on the assumption that clinicians who utilise the Meihana model have a clear understanding of cultural safety and cultural competency (Pitama et al., 2007). It has also been noted that the Meihana Model relies on the support from systemic structures to allow clinicians to apply the model in its entirety.

Te Pae Mahutonga is another Māori framework that is designed based off of the six stars as a reference to key navigational points of the Southern Cross (Durie, 2004). It is a symbolic chart mapping the different aspects that should be considered in health promotion (Durie, 2004). The four central stars represent the four key foundations of health: Mauriora (cultural identity) refers to the cultural identity and access to the Māori world view; Waiora (physical environment) explores the connection of the external world and spiritual elements humans connect with; Toiora (healthy lifestyles) is dictated by the individual's personal lifestyle shifting potentially harmful behaviours to a healthier approach; and Te Oranga or Whaiora (participation in society) considers the individual's ability to participate in society (Durie, 2004). The two pointers in the Te Pae Mahutonga symbolise two additional key components: Ngā Manukura (community leadership) highlights the importance of effective leadership at all levels in the work force, while Mana Whakahaere (autonomy) considers the autonomy and recognises the relevant processes, aspirations and self-governance (Durie, 2004). All the elements in Te Pae Māhutonga are used as a symbolic map for bringing together the significant components of health promotion as they apply to Māori health.

Finally, another model uses Te Wheke (the octopus) to identify the key factors that impact Māori health. The head of Te Wheke represents family. The eyes represent the health and wellbeing of the individual and the family, and each of the eight tentacles represent specific aspects of health (Durie, 1995). The eight dimensions are: wairuatanga (spirituality), tinana (physical), hinengaro (mental), whanaungatanga (family), mana ake (uniqueness), mauri (vitality), hā-a-koro-mā-ā-kui-mā (inspiration from ancestors), whatumanawa (emotions), and waiora (connection to external world). This model exemplifies the many intricate aspects that must be considered when working with Māori health. There are many elements that should be included when working with Māori communities to improve their health. Each factor identified above plays a bigger role than simply improving the physical health of a Māori population.

These health models illustrate one way that Māori researchers and health professionals have demonstrated the application of Māori values and principles in relation to the health

system. These models provide a frame for understanding health from an Indigenous point of view that is inclusive of both health and wellbeing and often serves in contrast to the approaches found in basic Western science (Murchie, 1984). While this section has discussed health models from a Māori perspective to reduce health inequities, the next section highlights two types of interventions commonly implemented for Indigenous communities with the same goal of reducing health inequities; evidence-based interventions and culturally-adapted interventions.

1.1.4   Evidence-based and Culturally-adapted Interventions

Evidence-based interventions (EBI) is a widely discussed approach for developing and implementing health interventions. EBI is commonly defined as comprising two or more randomised group designs, preferably with two or more groups of investigators that examine the outcomes of a programme (Fixen et al., 2009). This approach is a meticulous and cautious method of collecting evidence to use when making decisions about which health interventions to implement (Sackett et al., 1996). EBI requires that practices involved in the development and implementation of the intervention are to be evidence based; this means prioritising scientific research studies of randomised control clinical trials that focus on the isolation or reduction of a specific health issue (Grypdonck, 2006).

Each year billions of dollars are spent in countries around the world to support the development of evidence-based health interventions designed to improve human health and health inequities (Cooksey, 2006). Yet, only a small fraction of these innovations are ever implemented into practice (Haines et al., 2004), and efforts to implement these practices can take many years (Chaudoir et al., 2013). It has been noted that governments and health organisations often authorise the use of evidence-based interventions without allocating the appropriate resources and time for the intervention to be culturally tailored to the community it is serving (Duran et al., 2010). This is where community based participatory research (CBPR) becomes popular with Indigenous communities as its key principles include cooperative, co-learning, and empowering processes that acknowledges the community and its world views/approaches (Chen et al., 2012). As identified earlier, a re-occurring factor in many of the Māori health models is the aspect of developing interventions to address Māori health and health equity. As a result, more and more Indigenous approaches are incorporating community-based or culturally adapted EBI (Duran et al., 2010; Kaholokula et al., 2012; Wallerstein et al., 2018).

CBPR prioritises the voice of the community and ensures their values are reflected by focusing on the strengths and resources within the community. Additionally, CBPR fosters a co-design process where the community is involved at all stages of creation, implementation and evaluation of the health intervention. Finally, CBPR encourages a balance of research elements and community contribution to work towards more sustainable outcomes for the community (O'Mara et al., 2015). Research shows that CBPR health programmes are key to overcoming challenges related to the adoption and sustainability of the programme (Murdoch-Flowers et al., 2019). This is due to the tailored programmes and messages to participants as the co-creation with key community members create a sense of ownership within the community. It has been well documented that the inclusion of community leaders, community health workers, and researchers in the design and delivery of the health programme can lead to better implementation outcomes and ultimately health outcomes for the community (Chaudoir et al., 2013; Haines et al., 2014; Sussman et al., 2006). These are the benefits of a CBPR approach in implementing health interventions with communities.

The difference in these two approaches is that EBI focuses on the isolation or reduction of the specific health issue, and CBPR works to empower communities to create a sense of ownership of the intervention to encourage adoption. Both approaches have implications for Indigenous communities and when combined there is potential to achieve positive health outcomes. It has been noted that many health interventions are ineffective or unable to achieve outcomes once they are implemented outside of research settings and into community-based organisations (Kilbourne et al., 2007). This may be a result of reduced reliability of the intervention, lack of guidance in customising interventions to the community or support in implementing the intervention in a cost-effective manner without effecting the outcomes of the intervention (Kilbourne et al., 2007).

Although EBI provides a good structure for interventions, there is a need for closing the gap between research and practice especially for community-based or culturally adapted interventions. CBPR recognises the multilevel barriers across the health care system and works to implement EBI in a more appropriate manner that allows for better adoption of the intervention leading to better health outcomes. Implementing EBI health interventions with CBPR processes requires a sound understanding in the translating, diffusing, and disseminating phases which is discussed in the next section.

1.2 Implementation Science Theories

The implementation of evidence-based and culturally-based health interventions is a complex process involving three key components to be considered within a wide range of multi-level variables: diffusion, translation and dissemination. The implementation context considers the chosen community and the complexities that come with their social normalities (Haines et al., 2004). The implementation context must also consider those who will be implementing the intervention and the resources available to them (Haines et al., 2004). The phases of diffusing, translating and disseminating health interventions are essential in understanding the process of implementing health interventions effectively within Indigenous communities.

An often used definition for diffusion has been provided by Katz et al., (1963):

Diffusion is defined as the acceptance over time of some specific item-an idea or practice by individuals, groups or other adopting units, linked to specific channels of communication to a social structure, and to a given system of values, or culture. (p. 237)

Diffusion refers to the process that occurs as people adopt a new idea, product, practice, philosophy, and so on (Kaminski, 2011). Diffusion occurs through a combination of the need for individuals to reduce personal uncertainty when presented with new information, the need for individuals to respond to their perceptions of what specific credible others are thinking and doing and finally the general social pressure to do as others have done (Dearing, 2009).

In the health profession, translation describes an extended process of how research knowledge that is directly or indirectly relevant to health behaviour eventually serves the public (Sussman et al., 2006). When defining translation it is important to note that there are different definitions across disciplines; however, a generic definition describes translation as exploring how to transfer scientific discoveries into practical applications to improve health (Mercer et al., 2007). Public health agencies tend to view translation research as building the evidence base for integration of applications into practice and demonstrating health impact at the population level (Khoury et al., 2007).

Dissemination is the method of identifying and spreading evidence-based interventions that are widely used to target a specific audience via channels using planned strategies (Johnson et al., 1995; Lomas, 1993; Rabin et al., 2008). Effective dissemination has been described as a

push-pull process (Kerner et al., 2005). The adopters the intervention is designed for must show an interest in the intervention (pull), whilst at the same time those who designed it must show an effort in supporting the adopters to implement the intervention (push) (Kerner et al., 2005). Research that pertains to dissemination primarily focusses on the processes and factors that lead to a target population using an intervention; in doing so, identifying the most effective methods to implement the intervention elsewhere (Rabin et al., 2008).

The next sections describe four theories that reference different aspects of these concepts. First, diffusion and dissemination will be discussed in relation to the Diffusion of Innovation Theory. Second, translation will be examined in relation to Actor Network Theory. Thirdly, the RE-AIM model will be used to explore planning, implementing, evaluating, reviewing, and reporting of implementation science and dissemination research. Finally, a novel Māori implementation framework, He Pikinga Waiora, is introduced to provide an Indigenous perspective on each of the processes described and the impact the framework has on each stage of implementation.

1.2.1 Diffusion of Innovation Theory

The Diffusion of Innovation theory (DoI) has been widely applied to implementation science to assess the extent to which the implementation process affects implementation outcomes (Rogers, 2003). It is considered the single most influential theory in the broader field of knowledge in implementation science (Nilsen, 2015). DoI is often referred to as a change model for guiding health interventions where the intervention itself has been adapted and delivered in a way that is appropriate to the community it is trying to serve (Kaminski, 2011). Appropriate adaption and delivery are essential to effective implementation due to the importance placed on the communication and networking within the adoption process. Furthermore, this theory highlights the impact health organisations play in ensuring successful adoption and implementation by identifying relevant key messages and frameworks applicable to the diffusion of the health intervention (Nilsen, 2015). Ultimately, DoI endeavours to increase efficiency when diffusing health interventions with the aim being for interventions to persuade and reach many potential adopters at a low cost (Dearing, 2009). The five key components of the diffusion theory to be discussed next are: an innovation; innovativeness of the adopter; time; social system; and communication channels (Rabin et al., 2008; Rogers, 2003).

Innovation is the component that addresses an adopter's perception of the specific idea (Rogers, 2003). Five key characteristics determine the speed at which an innovation is adopted. Relative advantage is the degree to which an innovation is considered better than the idea it surpasses. Compatibility is the degree to which an innovation aligns with existing values, past experiences and needs of potential adopters. Complexity is the degree to which an innovation is difficult to understand and use. Trialability is the degree to which an innovation may be tried out on a limited basis. Finally, observability is the degree to which the results of an innovation are visible to others (Dearing, 2009; Kaminski, 2011; Rogers, 2003).

The type adopter also influences the speed of diffusion. In terms of the adopters there are five different types of people related to innovativeness (Dearing, 2009; Kaminski, 2011; Rogers, 2003). The first is the "innovator;" innovators can also be known as enthusiasts who are quick to adopt the innovation because they are risk takers. The next type is the "early adopters;" they are also known as visionaries. Although they are not known as risk takers they have a natural desire to be trend setters/role models. "Early majority" are the next type of adopters and also known as pragmatists. They need deliberate contact from trustworthy sources and tend to make slow steady progress. The next adopters are the "late majority;" they are also known as conservatives as they often adopt due to peer pressure. They are usually cautious and require "bulletproof" solutions. The last group to adopt to an innovation are the "laggards." They are known as being the sceptics as they are suspicious of innovators and are resistant to change. They will only adopt if it is the last resort. The "laggards" are present in every intervention and assist in identifying the rate at which everyone adopts or reject the intervention (Dearing, 2009; Kaminski, 2011; Rogers, 2003).

Time refers to the innovation-diffusion process and the rate of adoption (Rogers, 2003). The individual adoption process has five key stages that indicates where the individual is in their progression with adopting the innovation (Dearing, 2009; Kaminski, 2011; Rogers, 2003). Knowledge/awareness is the stage when the person is exposed to innovation (e.g., sees an advertisement, or hears about it) but lacks motivation to act. Persuasion/interest stage is when they are interested in the new idea and seek additional information. Decision/evaluation follows when the individual mentally applies the innovation to present and future situations to make a choice whether to use it or not. Implementation/trial is the stage where they make full use of the innovation. The final stage is confirmation/adoption; eventually individuals will decide to continue full use of innovation. Therefore, the time indicates the aspects that either lead the individual to fully adopt the innovation, or decide to reject the innovation (Rogers, 2003).

The social system refers to a set of components that are connected to work collaboratively to solve problems and achieve a common goal (Rogers, 2003). The social system influences the diffusion of innovations through its social and communication structure; it will either facilitate or impede the diffusion process. Within the social system there are certain aspects that influence an individual's behaviour and decision making: opinion leadership (e.g., community leaders, role models), change agents (e.g., doctors, nurses, community health workers, etc.) and advisers. Also within a social system, there are consequences for the influence of diffusion, changes occur to the individual and the social system as a result of the adoption or rejection of the innovation (Rogers, 2003).

The last component of DoI is the communication channel or the way in which a message gets from one individual to another and the impact of the chosen method (Rogers, 2003). Channels are often described as interpersonal (e.g., network of friends) or mass media; social media blends aspects of both (Rice, 2019). These channels are posited to work differently for different stages of adoption. For example, to raise awareness of an innovation mass media channels are considered effective. However, to inform and change attitudes towards an innovation an interpersonal channel is better suited (Rogers, 2003). Selecting the appropriate channel to communicate about an innovation determines the success rate of which and individual will identify with the new idea. When used appropriately, communication channels increase the chances of an individual adopting the innovation.

DoI is considered an influential theory (Nilsen, 2015). There are over 5000 published studies across a variety of academic fields on the use of diffusion of innovations theory (Haider & Kreps, 2004). Specifically, in the health sector, studies using DoI are predominantly concerned with the promotion and maintenance of the health of a community or population (Haider & Kreps, 2004). Previous studies in the New Zealand health sector have used DoI to explore, debate, and organise their observations and thinking (Chambers et al., 2004). The principles of this theory can also be found in studies of technology transfer for Māori and with health interventions in other Indigenous communities (Ruckstuhl et al., 2019). This thesis endeavours to discuss the implications of using DoI to implement a health intervention specifically with a Māori community.

1.2.2 Actor Network Theory

The translation of evidence-based guidelines into practice is one of the most challenging problems in health care and disease prevention (Khoury et al., 2007). Despite

extensive public health research on the efficacy and effectiveness of health promotion and disease prevention strategies, methods for disseminating these interventions and encouraging their implementation and wide-spread adoption are not well developed or evaluated (Khoury et al., 2007). The limited success of dissemination and implementation strategies to increase the use of research in decision-making suggests that transforming research into practice is a demanding task, requiring academic knowledge and discipline, as well as creativity, skill and organisational savvy (Majdzadeh et al., 2008). Specifically, in Indigenous studies knowledge is local and unique to the cultural context; it focuses on problem solving and is the basis for community decision making in all areas (health, education, etc.) (Lee et al., 2020; Wallerstein & Duran, 2010). When translating research into practice it is vital that the intervention is culturally supported by the community, and that the translation of knowledge from the research staff to the community is a combination of both Western and Indigenous health knowledge (Wallerstein & Duran, 2010).

A theory that has been applied to translation of interventions is Actor Network Theory (ANT). ANT aims to understand all the elements in the translation process of health interventions and includes both human and nonhuman contributions (Littlejohn et al., 2017). ANT has its own principles based on a set of assumptions that the world consists of many networks that are referred to as actors; these include humans, things, ideas and concepts (e.g., tikanga) (Miettinen, 1999). An actor is defined as "the source of an action regardless of its status as a human or non-human" (Miettinen, 1999, p.173) in some cases this has been referred to as radical in that it challenges the notion that non-living things (eg., technology, furniture, objects, etc.) can have agency too (Cresswell et al., 2010; Prout, 1996). ANT has been described as a toolkit for revealing stories about the relationships of different practices and the function of gatherings that give the actor the option to act. ANT enables health researchers to explain with greater precision the elements that are incorporated in translating a health intervention and the importance of their role in achieving the desired outcome (Prout, 1996). This is because those interactions in the real world (Law, 2008) work to identify how networks assemble or do not. A key aspect of ANT is tracing the relationships between the actors involved in any given event; it assumes that the outcome of the event is a result of the specific human and non-human actors involved in that place and time (Cresswell et al., 2010). Tracing relationships is a point of discussion that divides many scholars as ANT neither asserts that everything is socially constructed, nor does it perceive everything is pre-existent (Miettinen, 1999). The tracing of relationships is a key aspect for translating health interventions as it

enables ANT to investigate and theorise how networks come into being. This looks like tracing what associations exist, how they move, how actors are enrolled into a network, how parts of a network form a whole network and how networks achieve outcomes (Doolin & Lowe, 2002).

An advantage of this theory is to breakdown how social forces affect the outcomes or the establishment of certain situations (Cresswell et al., 2010). An example of this is the role of power in an organisation. Law (1997) notes that depending on the organisation structure and resources, a computer and a phone can serve to create a source of power for the manager. With a computer and phone the manager can establish their role as a source of power for other actors. However, if the manager is isolated and excluded from activities with other actors, regardless of the computer and phone, they can be viewed as powerless (Law, 1997). ANT assumes that if any actor, irrespective of its position, is removed from or added to the network then the overall function of the entire network will be affected (Cresswell et al., 2010, Doolin & Lowe, 2002). For example, working to translate a health intervention without tikanga would be a futile effort for a Māori community. The addition and/or removal of actors is almost expected as networks are constantly changing and evolving as a social reality; therefore, networks are assumed to be both complex and fluid (Cresswell et al., 2010). Another advantage of ANT is its ability to offer researchers ways to breakdown networks when things in a system go wrong; these are the actors and relationships between actors that tend to go unnoticed when things are working smoothly (Prout, 1996). ANT helps to expose those actors and explore how to re-configure and reorder the networks over time (Prout, 1996). For example, a health intervention may work very well when community members are involved, but will fail if they are not. For that reason, this theory works to bridge the gap between theory and practice, social groups and systems, disciplines, spaces, levels, and scales (Draude, 2017; Lee et al., 2020).

In addition to providing insights into all the actors and networks involved in the process of translating health interventions, ANT also involves considering the system, the policies, the organisations, the communities and how they all play a role in the implementation process and health outcomes. When translating health interventions, ANT considers more than just the impact of human interaction. It factors in the way policies dictate how individuals move through the system and the resources they have available to them (Law, 2008). Although there is plenty of research around the use of ANT and technology (Cresswell et al., 2010; Doolin & Lowe, 2002; Law, 2008), there is little on its use with Indigenous health interventions. Culture is an actor that plays a central role in translating health interventions with Indigenous communities. ANT highlights the relationships between different actors have on the outcome

of the intervention. Excluding the cultural actor from the translation process affects the wider network which in turn dictates the success of the health interventions. ANT has the potential to serve as a tool to analyse the role Indigenous beliefs and perceptions play in ensuring the best health outcomes when translating health interventions.

1.2.3 RE-AIM

RE-AIM is a conceptual model to guide researchers and practitioners in the development of adequate multi-stage and multi-level indicators when evaluating dissemination and implementation efforts (Rabin et al., 2008). RE-AIM is an acronym for the key elements of the model: reach; efficacy or effectiveness; adoption; implementation; and maintenance (Gaglio et al., 2013). Reach refers to the number of individuals that receive information about a given initiative. Effectiveness/efficacy is the impact of an intervention on positive or negative outcomes such as quality of life and economics (Gaglio et al., 2013). Adoption is the absolute number of settings or intervention agents who are willing to initiate a program. Implementation refers to the extent to which a program is delivered as intended (Glasgow et al., 1999). This includes consistency of delivery as intended and the time and cost of the intervention (Gaglio et al., 2013). Finally, maintenance is the extent to which a program or policy becomes institutionalised or part of the routine organisational practices and policies. Maintenance measures the extent to which innovations become a relatively stable, permanent part of the behavioural characteristic of an individual (Glasgow et al., 1999).

RE-AIM is designed to help evaluate interventions and public health programs, to produce a balanced approach to internal and external validity and to address key issues important for dissemination and generalisation (Gaglio & Glasgow, 2012). With over 150 published studies (Gaglio & Glasgow, 2012; Glasgow et al., 2006) and an increasing number of grant studies using the model, RE-AIM is growing as a theoretical model for the planning, implementation, evaluation, review, and reporting of implementation science and dissemination research (Kessler et al., 2013). RE-AIM should be considered as it is a forward-thinking model: a) it works to anticipate what might happen; b) it plans for a sustainable outcome; and c) it is able to overcome unexpected barriers (King et al., 2010).

RE-AIM offers a different perspective from existing theories regarding dissemination. It has been proposed as a method that is able to facilitate dissemination of research into practice (Bakken & Ruland, 2009). Its point of difference is that it is intended to help in the planning, conduct, evaluation, and reporting of research studies rather than to only guide the

implementation of a specific innovation. Its dimensions allow RE-AIM to be a method for increasing the likelihood that a particular intervention will work either across settings or in a particular setting (Bakken & Ruland, 2009). Not all elements of RE-AIM are used in interventions; only elements that are relevant are implemented (Gaglio et al., 2013; Kessler et al., 2013). Although there are no direct examples of RE-AIM being used in Māori communities, it is a framework that has proven to work well in community based and public health interventions (Glasgow et al., 1999). RE-AIM has potential to integrate and tailor evaluation processes to allow for Māori tikanga and values to be included in the dissemination process.

1.2.4 He Pikinga Waiora Implementation Framework

DoI, ANT and RE-AIM are all well-established implementation theories for a Western society in diffusing, disseminating and translating health interventions. There are many advantages to employing these theories for implementing health interventions and ample evidence of the effectiveness of each theory (Gaglio et al., 2013; Law, 2008; Rogers, 2003). However, there is little research on the advantages these theories may have for Indigenous health outcomes, or more specifically, Māori community health outcomes. It is well documented that Indigenous approaches to health must include a holistic approach (Durie, 1985; Nuku, 2013; Pitama, 2014). Therefore, a framework is needed that acknowledges and incorporates Indigenous values and theories and the different stages of implementation science; diffusion, dissemination and translation.

He Pikinga Waiora (HPW) is a theoretical framework that fills a gap in regards to the lack of implementation models for Indigenous communities. HPW is built on strong international evidence for best practice in developing and implementing health interventions (Oetzel et al., 2017). The framework was designed by researchers in New Zealand and focuses on serving Māori communities. HPW is theoretically grounded in a Māori approach that emphasises community autonomy and self-determination in interventions aiming to reduce health inequities (Oetzel et al., 2017). Kaupapa Māori underpins the HPW framework to ensure the local communities are involved in every stage of implementation science. Kaupapa Māori is a research methodology that prioritises the knowledge, values, and goals of the Māori community it aims to serve, thus, ensuring that at every stage of intervention development community voice is acknowledged and included (Oetzel et al., 2017; Pihama, 2012).

The key constructs of the HPW framework are embedded in the Kaupapa Māori approach and supported with international research: culture-centered[1] approach, community engagement, systems thinking, and integrated knowledge translation. First, the culture-centered approach (CCA) argues that social structures of health can be transformed by providing opportunities for community voice, reciprocity among researchers and community, and providing resources to address structural challenges (Ramsden & Spoonley, 1994). Facilitating aspects of CCA include asserting Indigenous self-determination, challenging power imbalances and health researchers/professionals being reflexive and adjusting their behaviour to enhance cultural safety (Oetzel et al., 2017). This ensures Indigenous cultural perspectives are part of defining the problem and integrated into the intervention to facilitate implementation effectiveness and address health equity (Oetzel et al., 2017).

Second, high levels of community engagement (CE) are associated with greater implementation effectiveness and improved health outcomes and health equity (Oetzel et al., 2017). CE is a process of collaborating with those Indigenous communities directly affected by a particular health issue or with those who are working with said communities (Oetzel et al., 2015). In this framework, CE ranges from very limited community involvement to community ownership and management through five categories: outreach, consultation, involvement, shared leadership and community-driven (Oetzel et al., 2017). When done correctly, CE is reflected through shared decision-making and communication among researchers and community members which helps with sustainability, capacity building and long-term health outcomes (Oetzel et al., 2017).

Third, systems thinking (ST) helps to address the complexity of the communities and the variety of levels and determinants of health problems (Oetzel et al., 2017). ST also facilitates new approaches and strategies that are associated with improved project and health outcomes including health equity (Hirsch et al., 2010). It fosters innovative ways of thinking for researchers, practitioners and community members through considering different perspectives, relationships among people of the health system and multiple level of analysis. ST acknowledges holistic perspectives towards health problems by examining the inter-relationships of the various parts that need to be understood within a larger context (Oetzel et al., 2017). ST elements have the potential to serve as guidelines for implementation of health

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[1] 'Centered' is purposely spelt as it is in the He Pikinga Waiora Framework. Therefore, when I refer to the construct throughout the thesis it will be spelt in accordance with the American English spelling.

interventions for Indigenous communities that include multiple perspectives, relationships and levels of analysis along with feedback loops.

Finally, integrated knowledge translation (IKT) emphasises the transfer of knowledge to enhance sustainability in the development and implementation of an intervention (Strauss et al., 2009). IKT involves the researchers and end users (clinicians, policy makers, tribal leaders and systems administrators) to ensure there is shared ownership and that barriers to implementation and translation can be addressed early in the design process (Oetzel et al., 2017). For Indigenous communities especially, IKT also works to ensure there is benefit for the community reflected in the knowledge of the community.

Overall, HPW is essentially an extension of CBPR approaches that work to involve community and researchers to co-design, co-implement and co-evaluate health interventions. The uniqueness of HPW is the key constructs and how they each work to empower and prioritise community value in the implementation process. An example of the framework being used can be found in a case study where HPW was used to discuss the challenges and successes of implementing an intervention with Māori communities (Oetzel et al., 2020). This case study highlights benefits of using a framework committed to community engagement; establishing strong relationships, emphasising community strengths, overcoming historical mistrust, building capacity, and changing systems and policies for community benefit (Oetzel et al., 2020). Although HPW is only a relatively new framework, it has potential for implementing health interventions in New Zealand, and especially for Māori communities, where the intervention not only focuses on the health outcome, but also recognises the importance of the Indigenous approach to implementation science.

1.3 Purpose and Overview of the Study

This part of the chapter provides the purpose of the thesis and an overview of each of the remaining chapters. The purpose of this thesis is to highlight the facilitators and barriers of implementing health interventions with Māori communities in New Zealand. This thesis aims to contribute to the conversation about reducing health inequities Māori communities' face in New Zealand by enhancing implementation effectiveness. Therefore, it is an effort to move towards achieving health equity and increasing positive health outcomes for all Māori communities.

To provide a visual summary of this chapter, a model was developed to encompass key aspects that must be considered when implementing health interventions with Māori communities to achieve health equity. The name of the model is 'Māori Implementation Science Strategy'. The overall aim of the strategy is to provide a breakdown of influential factors that must be acknowledged in the implementation process. Figure 1.1 is the model for the study; it illustrates the key elements related to health equity in the context of implementation science and the focus of this thesis.

Figure 1: Māori Implementation Science Strategy
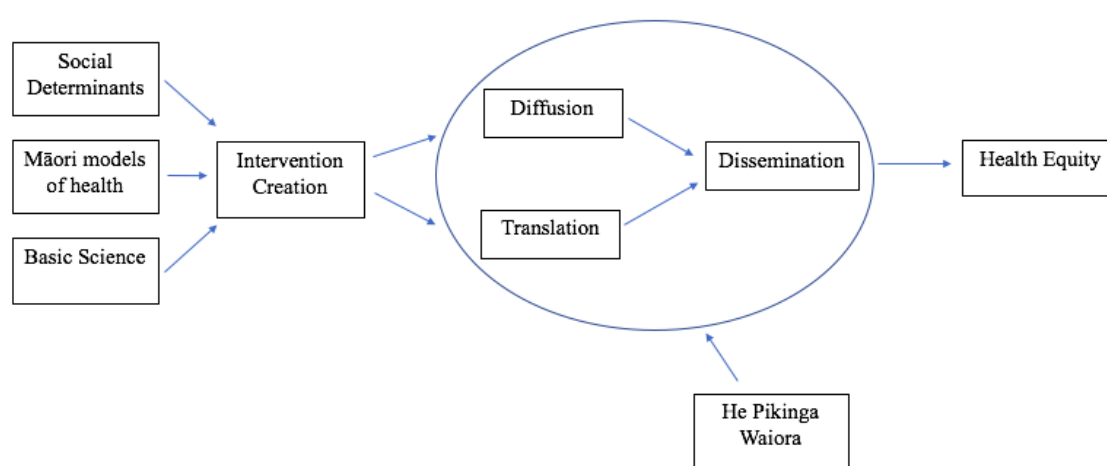
Firstly, it is important to acknowledge the historical events that have impacted Māori health and the current social determinants Māori face in the health sector. From there, it is evident why so many Māori health models have been developed to combat the health inequities Māori face and empower more holistic approaches that align with Indigenous cultures. The first part of the model demonstrates how it is the social determinants, Māori models of health and basic science that are the context that drives the creation of health interventions.

Secondly, the key elements of implementation science are presented: diffusion, translation and dissemination. Once an intervention is created, it is critical to discuss the importance of translating, diffusing and disseminating the health intervention effectively. Typically, this section tends to have a top-down approach where those receiving the intervention have minimal interaction other than receiving it. As this thesis focuses on an Indigenous approach, the model includes the HPW framework. HPW is the Indigenous/Māori element that guides the science behind the implementation process. It challenges the traditional

approach and fosters community involvement/engagement in all stages of translating, diffusing, and disseminating health interventions.

Thirdly, this model positions health equity as the end goal of the Māori Implementation Science Strategy. With the inclusion of the HPW framework the model it acknowledges the context of the interventions and demonstrates how including Māori communities in the implementation process can lead to better health outcomes which in turn leads to better health equity. This is the ultimate purpose of this thesis; to improve health equity for Māori communities. Through identifying the key elements required for implementation science, positive progress can be made for those most affected by the many avoidable health issues. This thesis aims to shine a light on the current perceived facilitators and barriers of Māori implementation science in an effort to highlight the areas of success and improvement

This research was undertaken as a "PhD with Publication" (referred to as the whole project) which includes four individual studies providing a comprehensive understanding of the facilitators and barriers of implementing Indigenous health interventions. Although the four studies were completed in their own right, they were designed to be interrelated both in theory and practice. Each study discusses an aspect of implementation science and the same theories informed the research questions and tools for data collection across the studies. The remainder of this thesis is comprises six chapters.

Chapter 2: Methodology and Methods. This chapter provides a discussion of the overall methodology, followed by an introduction to the individual studies and detailed methods for each one.

Chapters 3, 4, 5, and 6 are the four studies, each focusing on one of the four individual studies (three published; one in review). The published articles are presented in their published form and thus numbering of tables and figures within those studies will be different than the overall thesis. The tables and figures in the published articles are also not included in the table of contents.

Chapter 3/Study 1: The purpose of this study was to conduct a systematic literature review to look at the implementation effectiveness of health interventions for Indigenous communities using HPW as an evaluation tool.

Chapter 4/Study 2: The purpose of this study was to research the perceptions of health professionals in co-designing health promotion interventions with Indigenous communities in New Zealand.

Chapter 5/Study 3: The purpose of this study was to identify the facilitators and barriers health professionals in New Zealand perceived in disseminating and adopting a health intervention developed by a community-academic partnership.

Chapter 6/Study 4: The purpose of this study was to identify factors that New Zealand health professional's rate as important for implementation effectiveness for health interventions with Māori communities.

Chapter 7: Conclusion. The final chapter provides a summary of the main findings from each study, which are synthesised and discussed regarding the whole study. This section is followed by a discussion of key themes, the implications, limitations and closing remarks.

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Chapter 2 - Methodology

2.1 Introduction

The research for this thesis is based on the past and ongoing experiences of implementing health interventions for Māori communities in an effort to improve health equity. Given the focus, there is a need to adopt a methodology consistent with Māori world views and a value-oriented philosophy. The most prominent orientation to addressing these philosophies is Kaupapa Māori and is adopted in this thesis along with the methodology of the He Pikinga Waiora (HPW) Implementation Framework. This chapter provides the overall methodology of the wider thesis and its relevance to each of the studies. The first section describes the Kaupapa Māori methodology and the impact it has on this thesis. The second section discusses the HPW framework and how its philosophy has framed and guided this thesis. The third section identifies the role of the researcher and how it shaped the chosen methodology and other research choices. Finally, the fourth section provides a breakdown of the methods used for each study in this thesis.

2.2 Kaupapa Māori

Kaupapa Māori was the methodology employed as it is purposely designed to work with and for Māori. To begin this section, it is first important to acknowledge the historical event of the signing of the Tiriti o Waitangi (The Treaty of Waitangi) and the impact it has had on Māori and Māori research. The second section provides the origins of Kaupapa Māori methodology and why it was created as a response to the historical events affecting Māori health. To conclude this section the key principles are discussed to demonstrate how important each aspect of Kaupapa Māori is for Māori in research.

2.2.1 Te Tiriti o Waitangi – The Treaty of Waitangi

On the 6th of February 1840 Te Tiriti o Waitangi (TTOW; The Treaty of Waitangi)[2] was signed by Māori chiefs and representatives of the crown to formalise a relationship between Māori, the Indigenous people of Aotearoa (New Zealand), and the settlers (Kingi, 2006). There were two versions of the treaty drafted, one in te reo Māori (the Māori language)

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[2] I recognise that Te Tiriti o Waitangi and The Treaty of Waitangi are two different documents. The document of reference in this case is Te Tiriti o Waitangi and I am only providing a direct translation of the treaty for the wider International audience.

(Te Tiriti o Waitangi) and one in English (The Treaty of Waitangi). While the Māori version never ceded sovereignty and autonomy of Māori land, the English version facilitated the British to rule, colonise, and establish British systems of governance in a legitimate manner (Cram et al., 2006; Kingi, 2006). For Māori health, there were specific objectives of the Treaty that were specifically designed to address the Māori health issues that were already starting to arise (foreign diseases, displacement from loss of land, limited access to natural medicines, etc.) (Kingi, 2007). However, based on the dramatic population decline from 150,000 in 1800 (an estimate amount) to just 42,000 by 1896 (census), it was clear that the Treaty was unlikely to meet the health objectives (Kingi, 2007). The failure in materialising the Treaty health objectives does not fall on the Treaty itself; it can also be attributed to the lack of action taken by the Crown to fully implement its many promises, particularly in relation to Māori health (Kingi, 2007).

The lack of action taken by the Crown makes it all the more frustrating when opinions of the TTOW argue that the document prioritise Māori well-being by providing additional rights or privileges for Māori (Kingi, 2007). The attention these opinions receive can be harmful to Māori health advancement. The Treaty, above all else, promises equity for Māori including the same health and well-being benefits as non-Māori (Kingi, 2006) which is not the current state of affairs. For example, in the past common Western perceptions have been negative towards the Māori population in blaming the individual or the culture for the health issues Māori face (Cram et al., 2006), without recognising the role the Treaty played in Māori health. In the early part of the previous century, Western health professionals and systems began to perceive Māori as ignorant, shy, superstitious, or backward (Beaglehole & Beaglehole, 1946). The Western perceptions of Māori and the result of colonisation led to Māori abandoning their social structures and health practices and moving towards Western medicine resulting in cultural decay (Kingi, 2007). Māori epistemologies were, and continue to be challenged by Western science because in order for Māori knowledge bases to be seen as legitimate, Western science must acknowledge the history of the Treaty and the denied knowledge Māori have faced (Cooper, 2012; Killam, 2013). Additionally, Western science would need to accept the legitimacy and validity of Māori worldviews (Cram et al., 2006; Henry & Pene, 2001). Ontologically speaking, Māori conceptions of health contradict Western science as they tend to be based on holistic concepts and practices, such as the relationship between tinana (body) and wairua (spiritual essence), whānau (family) and hinengaro (mental), and the concepts of tapu (sacred) and noa (ordinary) (Dansey, 1992; Marsden, 1992). These

representations promote cultural integrated practices based on self-sufficiency and Māori knowledge about health and healing (Cram et al., 2006).

However, the epistemic violence Māori experienced following the signing of the Treaty saw their ways of knowing and living being deliberately dismissed and discredited by Westerners (Dotson, 2011; Kingi, 2007; Pihama, 2012). Western science questioned and doubted the value of Indigenous health approaches causing harm to the health and wellbeing of the Māori population (Dotson, 2011; Kingi, 2007; Pihama, 2012). Following the signing of the Treaty, Māori would experience the epistemic violence of colonisation with a devastating loss in their culture and knowledge after it was constantly ignored and rejected by the privileged Western practices and knowledge bases (Dotson, 2011). Yet, regardless of the Western opinions on Māori health and the lack of intervention from the Crown, the 1900s saw an increase in Māori resilience and a determination that led to one of the greatest recoveries of a population after the onslaught of colonisation (Kingi, 2006). This can be attributed to the willpower of Māori and their aspirations of reclaiming autonomy over their health and wellbeing (Kingi, 2006; Pihama, 2012). Today, Māori academics look to the past and see the resistance to colonial imperialism that was shown by past generations as a reminder to continue to push the boundaries and positively promote Māori ways of knowing and understanding (Pihama, 2005).

The next part of this section discusses a philosophy that is shaped by the knowledge and experience of Māori. Kaupapa Māori was born out of the Māori movements for change and is a deliberate effort to empower culturally defined and determined Māori research (Pihama, 2012). It acknowledges the trauma Māori have endured from the events following the signing of the Treat and it challenges Western research approaches through encouraging Māori to create their own research narrative as oppose to previously being studied on or about (Pihama, 2012). Kaupapa Māori acknowledges all the historical trauma and uses those learnings as the foundation to plan and strategise for a brighter future for the next generation (Pihama, 2012).

2.2.2 Kaupapa Māori Origins

Kaupapa Māori originates from Māori concepts. It was important to Māori academics that this methodology be developed by Māori for Māori and with Māori (Smith, 2000). Therefore, Kaupapa Māori directly aligns with Māori beliefs, values, and traditions (Mane, 2009; Pihama, 2012). Kaupapa Māori recognises the history of colonisation and the importance

of cultural integrity when analysing Māori issues and provides the tools to facilitate a Māori understanding of the political and historical context of Aotearoa (Pihama, 2012). Kaupapa Māori also equips researchers with cultural philosophies that allows them to appropriately engage with those who have relevant experience and share them in a positive light to empower the individual or community (Bramley et al., 2004). The overall aim of Kaupapa Māori is to improve the wellbeing of all Māori and bring positive outcomes for the communities the research addresses (Mane, 2009). Academics have agreed that the key components to this approach are the Māori language and the values of the culture (Barnes, 2000; Sissons, 2005; Smith 2000). Barnes (2000) specifically states that Kaupapa Māori is used to validate Māori knowledge, language, customs and practice. Furthermore Barnes (2000) and Sissons (2005) both agree that Kaupapa Māori research should include the right that Māori culture has to thrive in its land as the Indigenous culture.

Kaupapa Māori is unique to its culture as it questions the way Pākeha (New Zealand Europeans) treat Māori; Barnes (2000) observes that Māori preferred interests have been dominated and excluded by Pākeha. Kaupapa Māori works to remove these threats to the Māori culture by arguing that in order to understand, explain or respond to Māori issues there must be an approach that is embedded in Māori epistemologies (Pihama, 2012). Some academics have discussed the notion of Kaupapa Māori being grounded in critical theory (Eketone, 2008; Wiri, 2001). However, Māori academics have corrected these statements by clarifying that while Kaupapa Māori and critical theory both challenge the dominant systems of power, this does not mean Kaupapa Māori draws from a non-Māori theoretical framework (Pihama, 2012; Smith, 1997). Even though Kaupapa Māori works to decolonise Western research approaches and methods, it still holds space for non-Māori researchers to engage with and create research that allows those (researchers and participants) involved to feel comfortable and safe to share information about the topic (Mane, 2009). This is the nature of Kaupapa Māori research, those who engage with this methodology must remember who the research is for and who will benefit from it (Smith, 1997).

Overall research employing a Kaupapa Māori methodology should aim to create a change resulting in a positive difference for Māori. This methodology works to legitimise the realities that Māori face; and that the culture and language should be what the study is founded on (Bishop, 2005; Cram et al., 2006; Smith, 1999). Kaupapa Māori is a research methodology that validates Māori knowledge. The next section will discuss the specific principles related to

Kaupapa Māori to provide an in-depth breakdown of how the theory works to empower Indigenous approaches.

2.2.3 Kaupapa Māori Principles

The principles that are embedded in Kaupapa Māori stem from the promise of creating research that is self-determining, values the Māori world view and ensures Māori cultural practices are respected and maintained throughout the process (Walker et al., 2006). Kaupapa Māori axiology has five key principles; tino rangatiratanga (self-determination), taonga tuku iho (cultural aspirations), ako Māori (Māori world view), "Kia piki ake i nga raruraru o te kainga" (socio-economic mediation), and whānau (family) (Bishop, 2005; Smith 1997). Each principle and how they each contribute to Kaupapa Māori is discussed.

Firstly, tino rangatiratanga encompasses sovereignty, governance, autonomy, independence, as well as self-determination (Pihama et al., 2002). This principle guarantees that the power and control rests within a Māori cultural understanding and the research agenda is Māori-centred where the issues and needs of Māori are the focus of the outcomes (Walker et al., 2006). Tino rangatiratanga supports the idea that there is great satisfaction for individuals to gain control over their life and their culture (Smith, 1997). Through colonisation, there has been a struggle for Māori to obtain their autonomy and self-determination. Therefore, Kaupapa Māori acknowledges the struggles Māori have faced and uses them to underpin the methodology by using the Māori language, abiding by the Māori practices, and respecting Māori traditions (Cram, et al., 2006).

Secondly, taonga tuku iho (cultural aspirations) (Smith, 1997) acknowledges the language, the knowledge, the history, the fundamental protocols and everything else that relates to Māori behaviour (Barnes, 2000). Through every step of Kaupapa Māori research this principle recognises the strong relationships between emotional and spiritual factors (Barnes, 2000; Smith, 1997). The historical significance of taonga tuku iho makes it crucial for understanding Māori behaviour and perspectives in relation to the research as one of its key aspects is the use of the Māori language (Bishop, 2005). Through the Māori language a pathway is provided to the histories, values and beliefs of the Māori culture (Walker et al., 2006). It is a gateway to gaining and understanding information and perspective that would have otherwise been neglected. However, due to the effects of colonisation not all Māori research and participants are fluent in the language, Kaupapa Māori acknowledges this by allowing a mix

of Māori and English in its application (Walker et al., 2006), whilst still encouraging the revitalisation of the Māori language.

Ako Māori is the third principle, it recognises the way Māori prefer to be taught. Māori had already established a preferred pedagogy before Europeans arrived (Smith, 2000; Walker et al., 2006). They learnt through recognition and encouragement of giftedness, intergenerational learning, and learning and teaching conducted from students' strength (Hemara, 2000). Kaupapa Māori recognises that Māori have their own unique way of learning; this pedagogy is central when processing the research and analysing data (Hohepa & Jenkins, 2004). Ako Māori provides an epistemology that supports Māori researcher's view of the world and allows an Indigenous approach to their research (Walker et al., 2006). Māori knowledge and ways of knowing are sacred and require a special approach when conducting research, and unlike in the past it must be treated with respect and protected (Walker et al., 2006). Kaupapa Māori research ensures that the information learned and shared is done so in a manner where Māori protocols are upheld and maintained.

The fourth principle, "Kia piki ake i nga raruraru o te kainga", acknowledges that there are socio-economic disadvantages that Māori face (Smith, 2000). In fact, Kaupapa Māori is often used to challenge the socio-economic disadvantages, demeaning ideologies and power relations with which Māori are far too familiar (Walker et al., 2006). This principle does so by equalising the power imbalances to enhance the quality of life for Māori through the research that is conducted. It has been noted that if Māori do not benefit from the research then there is has been a lack of commitment by the researchers to this Kaupapa Māori principle (Walker et al., 2006). This principle recognises that despite these difficulties, Kaupapa Māori will provide a positive impact for whānau due to the practices and values this approach has in place (Smith, 2000).

The final principle is whānau. At the core of the Māori culture and protocols is the concept of whānau (Walker et al., 2006). This principle is not limited to the people in a family (immediate and extended); it is also the way in which Māori practice whanaungatanga, which is the way a family interacts and be with each other (Smith, 2000; Walker et al., 2006). Knowledge is shared and guarded by all whānau members, it is a collective approach that places greater value on the research because of the shared vision and support (Walker et al., 2006). The research process is also enriched with a whānau approach as it highlights how Māori communities can be generous and co-operative in sharing knowledge, given that it is a

reciprocal environment. Whānau is an integral part of Māori identity and culture; therefore, Kaupapa Māori research should use whānau and whanaungatanga to unite participants and researchers to create a more open environment for those involved (Bishop, 2005).

In order to protect the Māori cultural aspects of this study, Kaupapa Māori was adopted to ensure that the research benefited, or had the potential to benefit, the Māori culture or the communities involved. Kaupapa Māori is a methodology that provided this research with fundamental protocols that recognised the significance of the history, the language and the values of the Māori culture. This methodology was also selected as it catered to the purpose of this thesis. As this thesis required participants to share their personal experiences, Kaupapa Māori methodology provided a foundation for a safe environment for individuals to answer freely and without judgement. The research questions in the studies for this thesis fit Kaupapa Māori as they were designed to have a positive impact for the participants and the Māori culture. The next part of this chapter discusses how this thesis enacted Kaupapa Māori through the He Pikinga Waiora Implementation Framework. He Pikinga Waiora is also unique to the Māori culture and it is similar to Kaupapa Māori in that it also resembles other Indigenous values and practices too.

2.3 He Pikinga Waiora Implementation Framework

The He Pikinga Waiora (HPW) Implementation Framework was chosen for this thesis as it is designed to apply a holistic and collaborative approach to health research and is grounded in Kaupapa Māori methodology (Rarere et al., 2019). This thesis required a framework that catered to both qualitative and quantitative components whilst still acknowledging the significance of Kaupapa Māori methodology. Both Kaupapa Māori and HPW value the significance culture has within research and they both work to foster positive outcomes for Māori communities. Firstly, this section provides the study context for the wider thesis and the impact it had for the individual studies carried out. Secondly, this section discusses the rationale for HPW to frame this study emphasising its cultural relevance and efforts to highlighting Indigenous research. Finally, this section describes how each of the key principles of HPW were enacted and discuss how they are appropriate for the implementation of Kaupapa Māori within the context of this thesis.

2.3.1 Study Context

This thesis is connected to, and partly funded by two National Science Challenges. This thesis builds from the research gaps that were identified by these studies in trying to address Māori health equity through implementation science. The next paragraphs provides context on each study and discuss how they have impacted the wider thesis.

The first project was the "Kaumātua mana motuhake (KMM): Kaumātua managing life-transitions through tuakana-teina/peer-education", funded by Ageing Well National Science Challenge in Aotearoa. Ageing Well made a deliberate move to require all funded projects to include the principles of Vision Mātauranga Policy to reduce disparities and inequities experienced by some older New Zealanders (Ageing Well, 2020). Vision Mātauranga Policy is a NZ government policy that "aims to unlock the science and innovation potential of Māori knowledge, resources, and people for the environmental, economic, social, and cultural benefit of New Zealand" (Ageing Well, 2020). One of the goals for Ageing Well was to embed the funded research programmes in the Vision Mātauranga Policy to specifically transform the circumstances older Māori were facing and paying homage to the cultural traditions of Māori valuing and drawing on kaumātua (elders) knowledge and wisdom (Ageing Well, 2020). The KMM project employed a strengths-based approach that highlights the potential of kaumātua to be solutions to their own challenges building on the strength of their status or mana within Māori culture (Oetzel et al., 2019). The research investigated the health outcomes of a tuakana-teina (older sibling-younger sibling) peer education model in relation to key significant life transitions older people face (e.g., retirement, loss of spouse, loss of independent living, change in health conditions, loss of driver's license). KMM demonstrated that a culturally appropriate peer education interventions positively contributes to the ageing society (Oetzel et al., 2020). This project addressed the social disconnection Māori elders tend to face through cultural concepts that are relevant and inclusive of their identity and backgrounds which is particularly important given the strong links of isolation to poor health (Oetzel et al., 2020).

The second project was "He Pikinga Waiora (Enhancing Wellbeing): Making health interventions work for Māori communities", funded by The Healthier Lives National Science Challenge in Aotearoa. Healthier Lives is a national research collaboration dedicated to achieving healthier lives for all New Zealanders with a goal of reducing health inequities between populations 25% by 2025 (Healthier Lives, 2020). It aims to improve the prevention

and treatment of four of New Zealand's most prevalent non-communicable diseases: cancer, cardiovascular disease, diabetes and obesity. Its mission is "to deliver the right prevention to the right population and the right treatment to the right patient" (Healthier Lives, 2020). Stated within the purpose and mission of Healthier Lives is the goal to ensure health equity for Māori and Pacific communities. HPW is a framework that provides a culturally appropriate and theoretically-sound foundation for enhancing implementation of Indigenous health interventions (Oetzel et al., 2017). This framework was developed and designed by both Māori and non-Māori health professionals, researchers, and community health workers. It has many implications for health stakeholders as a planning tool, an evaluation tool, and a guide for those wanting to engage in health interventions with Indigenous communities (Oetzel et al., 2017). HPW acknowledges the challenges of achieving healthier lives for Māori and other Indigenous communities, and highlights the need for more focus to be placed on the specifics of implementation effectiveness and not just the intervention efficacy (Oetzel et al., 2017). It centres Indigenous knowledge and self-determination to provide a more complete picture of implementation effectiveness in Indigenous communities.

These two projects have contributed significantly to this thesis. They have guided the overall thesis and the individual studies in the approach to implementation science and the specific methodologies employed. This thesis worked alongside these two projects to research the gaps that were identified and build off the rich data that was collected in the process. For this thesis to develop with the projects it was imperative that it followed the same methodologies employed by these projects which were guided by Kaupapa Māori. Kaupapa Māori played a large role in ensuring the cultural integrity of both projects and was an integral part in the design, development, implementation, and evaluation processes. Over the development period of the HPW project it became evident that the framework would also provide a solid methodological approach as well as Kaupapa Māori for this thesis. As HPW is embedded in Kaupapa Māori principles they both complement each other and hold the researcher and the research accountable to creating positive health outcomes for Māori communities. The next section discusses HPW as a methodology and provides a rationale for its use in this thesis.

2.3.2   Rationale for Framework

Historically, Western scientific methods have been the preferred way of conducting health-related research, with only small acknowledgements made to alternative approaches like

Indigenous methodologies (Martin, 2012). Yet some of the greatest health-research achievements have come from methods that reflect similar values and perspectives of Indigenous communities (Martin, 2012). Colonisation saw Indigenous knowledge and approaches to health blatantly ignored and diminished (Kingi, 2006). In response to the ignorance shown by Western methods towards Indigenous knowledge, Indigenous health researchers and their allies seek to create more decolonised approaches that challenge the Western/scientific methods to contribute more positive narratives regarding Indigenous health methods and methodologies (Martin, 2012).

HPW prioritises the health needs of Indigenous communities and fosters health interventions that reflect the values and perspectives of the communities they serve (Rarere et al., 2019). Furthermore, the HPW framework advises that community involvement occurs at every stage of the implementation process; the problem definition, design, implementation and evaluation (Rarere et al., 2019). It is a framework that intentionally applies a holistic Indigenous approach to health that builds on community-based participatory research which is known to "embrace collaborative efforts among community, academic, and other stakeholders who gather and use research and data to build on the strengths and priorities of the community for multilevel strategies to improve health and social equity" (Wallerstein et al., 2018, p. 3). Having the knowledge of different stakeholders to the translation and dissemination of health interventions only adds value to the research and contributes to closing the health equity gap between Indigenous and non-Indigenous communities (Oetzel et al., 2017). HPW was employed for this thesis because it is a framework that breaks down the implementation process to insert an Indigenous narrative into every element. It can be used as a tool that allows researchers to critically reflect on their perspectives and requires them to make changes where perspectives clash with Indigenous communities (Rarere et al., 2019). In doing so, this ensures the whole research team, including the Indigenous community, embody the principles guiding their work.

Therefore, HPW was chosen for this thesis because it supports the notion that implementation science for Indigenous communities should be grounded in Indigenous knowledge (Oetzel et al., 2017). This framework is an extension of participatory approaches (Bell et al., 2016; Delafield et al., 2016; Wallerstein et al., 2018) and pushes the boundaries in regards to systems thinking. Even more so, since this framework was designed by researchers in New Zealand, it specifically focuses on Māori values and communities making it an appropriate fit for this thesis. Its focus on Māori communities means HPW is grounded in

Kaupapa Māori methodology (Oetzel et al., 2017) hence the selection of both HPW and Kaupapa Māori for this thesis. Overall, HPW highlights the facilitating aspects of Indigenous implementation (co-design, co-implement and co-evaluate), and provides solutions for the barriers (power imbalances, organisational constraints, and funding) researchers and Indigenous communities face when working collaboratively to improve health equity. The next section provides a discussion on how HPW framed this thesis with specific reference to the key constructs and how they each work to keep this thesis accountable to empowering Indigenous knowledge.

2.3.3   Framing of the Study

HPW provided very practical guidance for this thesis through its key constructs; culture-centered approach, community engagement, systems thinking and integrated knowledge translation. These four constructs are underpinned by Kaupapa Māori methodology, and they each contributed to this thesis in a unique manner. Kaupapa Māori plays an integral role in HPW and has been attributed with a whakataukī. The whakataukī is "e tipu e rea mō ngā rā o tō ao (grow and branch forth for the days destined to you)" (Oetzel et al., 2017. p. 2). This proverb was chosen because it pushes researchers to keep growing and learning. This proverb is an encouraging statement that provides a cultural foundation for the researcher to embrace when working with Māori values and knowledge (Oetzel et al., 2017). Given the HPW framework was intentionally designed with references to the Māori culture, each construct has a proverb known as a whakataukī or whakatauakī which provides a holistic interpretation of the construct and guides the relationship between research and Māori knowledge.

The first key construct is culture-centered approach (CCA). The overall goal of CCA is to highlight the agency, knowledge and perspective of the community that are needed in health interventions to increase the effectiveness of the implementation process and outcomes (Peterson, 2010) for all stakeholders involved. The whakatauki that guides this construct is "ko taku reo taku ohooho, ko taku reo taku mapihi maurea (my language is my awakening, my language is the window to my soul" (Oetzel et al., 2017, p. 3). For this thesis, this proverb draws attention to the importance of including community voice into the research. An essential part of addressing health inequities is the process of listening to the voices of the community and acknowledging their role in all phases of implementation (Dutta, 2008). By including the voices of those most affected it empowers them to exercise their own agency and create relevant health solutions that are framed by their experiences (Oetzel et al., 2017). By doing

so, the CCA guided this thesis by acknowledging that culturally-centered interventions begin by building partnerships and empowering the voices that have historically been marginalised and erased (Dutta, 2008; Dutta et al., 2013). Specifically, this research gathered the perspectives of Māori health providers, health professionals, and community workers in an effort to highlight their perceptions on the implementation issues Māori face. Additionally, as mentioned earlier this thesis is tied to two National Science Challenges that both support the promotion of Māori voices in health interventions. Research grounded in CCA aligns with Kaupapa Māori by prioritising the need to create spaces where the community voice is acknowledged and valued just as much as the other contributing pools of knowledge.

The second key construct is community engagement (CE). Research that employs this construct seeks to create positive changes in power relations, intervention sustainability, community transformation and building capacity for individuals and organisations (Wallerstein et al., 2018). The whakataukī for CE is "he urunga tangata he urunga pahekeheke, he urunga oneone mau tonu (the support of others in unreliable, the support of your own is sure)" (Oetzel et al., 2017, p. 4). This proverb highlights the need for community interventions to be co-developed and supported by the community members it is intended for (Oetzel et al., 2017). CE aligns with Kaupapa Māori by ensuring there is a co-creation of the research with community needs at the forefront, and culturally-centred methods are employed. For this thesis that means ensuring this research engaged with the community and that the community members are supportive and satisfied with the messages being portrayed. Including key community stakeholders as advisors and research participants facilitates shared decision making, leadership and communication (Bell et al., 2016) which reinforces the importance of incorporating community visions and goals (Oetzel et al., 2015). Specifically, the research studies were derived from insights of university and community researchers associated with the two projects. CE aligns with Kaupapa Māori by ensuring there is shared decision making and clear communication with the community involved in the research.

The third construct is systems thinking (ST). ST highlights the issue that reducing health inequities is not an easy task as there are many different perspectives that need to be understood to solve a problem (Hirsch et al., 2010). The whakataukī for this construct is "He tina ki runga, he tāmore ki raro (contentment above, firmly rooted below)" (Oetzel et al., 2017. p. 4). This proverb acknowledges the importance of considering a range of perspectives, levels, and understanding in the implementation process (Oetzel et al., 2017). Similarly, for this thesis, ST supports CCA and CE by ensuring that this research is inclusive of more than one

perspective. ST encourages researchers to look at the interrelationships between parts and their relationships to a functioning whole, by doing so barriers are identified earlier and can be addressed in the appropriate manner (Trochim et al., 2006). Given the nature of this study, Kaupapa Māori and ST also provides an important self-reflection element where the researcher can evaluate their role and observations and the impact it has on the perspectives portrayed in the thesis (Midgley et al., 2007). Specifically, this thesis included a range of perspectives (including both Māori and non-Māori) in the choice of study participants. It also emphasised research topics and questions that included holistic perspectives with the goal of identifying multiple solutions for achieving Māori health equity at the macro, miso, and micro levels.

The final construct is integrated knowledge translation (IKT). IKT is an important part of the implementation process yet it is often neglected in the practice of the creation, translation and implementation of an Indigenous intervention (Strauss et al., 2009). The whakataukī for IKT is "toi te kupu, toi te mana, toi te whenua (hold fast to the language, the culture and the land)" (Oetzel et al., 2017. p. 5). This proverb is used as a reminder to outline the process of researching and working with community members to ensure positive outcomes for the community (Oetzel et al., 2017). For this thesis, IKT relies on the Indigenous context to define the processes and interactions between researchers and health providers serving Māori communities. In many cases in the past the most basic level of IKT has been employed which includes only simple consultation with Indigenous health stakeholders (within and outside of the community) with minimal input of their knowledge (Smylie et al., 2014). This thesis was limited in the use of IKT as it had minimal consultation with health providers and research participants in the design and purpose of the thesis. As a PhD student I had limited access to end users in other contexts (community members and organisations). However, the research conducted was specifically developed and evaluated within the context of Kaupapa Māori and had implications for how IKT can be better utilised in the implementation of Indigenous health interventions.

Overall, the HPW Implementation Framework and Kaupapa Māori are suitable methodologies for this study as they demonstrate a sound foundation for enhancing the implementation of health interventions for Maori and all other Indigenous communities. Each principle of Kaupapa Māori and each element of HPW provides a unique perspective that works collectively to provide a holistic approach to implementation science. As the four elements recognise the importance of culture and community involvement, they are beneficial for this study as it re-affirms the significance of including Māori values and knowledge at every

stage of implementing health interventions into Māori communities. The next part of this chapter describes the role of the researcher and how Kaupapa Māori has guided the practices and methods of each study.

2.4   Role of Researcher

My upbringing, culture, and academic journey have all influenced the methods and methodologies that were selected for this study. This section firstly explains my 'why' for pursing this topic and share where my passion stems from. Secondly, a discussion on researcher bias is provided to demonstrate the procedures I undertook to ensure the integrity of the research throughout the course of this thesis. Finally, a brief paragraph describes the impact my previous experience in research has had on this current thesis and the advantages and disadvantages of my academic journey.

2.4.1   My Why

Chapter one discusses the impact the Treaty had on the health of Māori and to this day we are still fighting for the right to have autonomy over our health interventions, processes and methods. My personal goal for this thesis was to illuminate the inclusion of Indigenous knowledge in the many crucial processes of implementation science for the betterment of the people I care about most, my family. My family are my backbone and every step I take in my research is in search of better health outcomes for them and the people of my culture. I was brought up in a Māori home with strong family values. My family has faced many typical health issues similar to the health issues other Māori families face; diabetes, cancer, high cholesterol, and cardiac arrest just to name a few. This plays an enormous role on my choice of topic and my passion for Māori health. I watched my grandparents' generation struggle with the health system and saw the frustration on the faces of my parents' generation at the lack of cultural support they had available to them. It is not until I started learning more about the New Zealand health care system and the many barriers that Māori face when trying to engage with it that I realised nothing was going to change unless we (Māori) do something about it. I am inspired by my family and trying to create a future where access to health care is no longer a painful task of navigating a system that is designed to make you feel inadequate or at fault. Given the emotions attached to my thesis topic I needed to have processes in place to ensure my research reflected my findings and not my personal opinions.

2.4.2 My Academic Journey to a PhD

My academic journey began at a humble full immersion Māori school at the age of five. I was fortunate enough to attend that school until I was 15. I was deeply immersed in my culture and was surrounded by the stories and experiences of Māori excellence. In my last few years of high school I transferred to a mainstream girls' high school where I experienced many challenges and triumphs in navigating a new educational system. During my years at that mainstream high school was the first time I noticed a different attitude towards Māori. What I would not realise until later in my life is that was my first experience of racism and the struggles Māori face every day. From high school, I went straight into university studying a Bachelors of Communication Studies majoring in Management through the University of Waikato. It was during my last year in my undergraduate degree that I realised my passion for health when learning about all the inequities Māori face. Therefore, I decided to pursue a Masters of Management studies looking at the facilitators and barriers my small Māori tribe faced when engaging with the health system. After my master's degree the next decision was do I start working back at home with what I have currently learnt or do I still have more I need to research? The opportunity presented itself in the form of this PhD and since 2017 I have gained many new skills and experiences that I believe I can put to good use for the betterment of Māori health. I share this journey because I think it is important to acknowledge where I started; because of my early introduction to full immersion Māori I am now fluent in both English and Māori. My time at a mainstream high school prepared me for the many cultural shocks I would experience at university. If I did not have those experiences I know I would have struggled with the realities of Māori health and may have ended my academic journey a lot earlier. The following section discusses how I addressed researcher bias and the precautions I undertook to safeguard the results of the studies.

2.4.3 Researcher Bias

Health equity is what drives my motives for this thesis. I believe that everyone should have equal access to health services in New Zealand and the systems in place should facilitate that access. I am passionate about improving the implementation of Māori health interventions in an effort to achieve better health equity for Māori. Given my personal and cultural ties to this study I am aware of the researcher bias that I might bring to the research. Mehra (2002) identified that most researchers are commonly known to have researcher bias; in my case this is inevitable due to my personal beliefs and values stated above. The potential bias can include:

1) the researcher's mentality could pose a threat to the true value of data obtained from data analyses; 2) the researcher not being sufficiently prepared to conduct the field research; and 3) the researcher conducting inappropriate interviews (Chenail, 2011). Another potential bias is known as the term "insider investigator" (Chenail, 2011). Insider investigator is used to describe how one may limit their study by only discovering what they think they do not know, instead of allowing the research to evolve on its own without influence (Chenail, 2011). However, Mehra (2002) offered advice to help address the potential researcher's bias above in order to generate uncontaminated data. Mehra (2002) recognised that the researcher must; 1) remain neutral as possible; 2) allow the participants to share their perspectives without judgment; and 3) ask non-directive open ended questions. These are just some of the precautions I employed to ensure the data collected was untainted by my own personal beliefs. Additionally, the protocols of this study were checked by a supervisory panel to remove any potential bias in the questions and discussion topics.

My beliefs and values are reflected in the choice of study as well as the methodology. In addition to all the benefits stated earlier in this chapter on employing Kaupapa Māori methodology and the HPW framework for this thesis, I chose these methodologies because they protect myself and the reliability of the research. Firstly, they protect me by validating my beliefs and allowing me to use my cultural background for the benefit of this research. Kaupapa Māori and HPW acknowledge and encourage Māori researchers to use more culturally inclusive methods in research such as incorporating karakia (prayer) and mihimihi (formal introductions) at the beginning of my interviews. These are customs that come naturally to me in my culture and Kaupapa Māori and HPW allows me to ethically implement these practices in an appropriate manner. Secondly, Kaupapa Māori and HPW protect the integrity of the research by requiring academics engaging in Māori related topics have positive outcomes and prioritise the needs of the Māori communities. Specific examples undertaken for this study include; applying for ethical approval for human related studies, having a cultural advisor, pre-testing the interview guide for feedback on questions, discarding invasive or difficult questions and ensure the findings are a representation of the data and not the researchers' opinion. The next part of this chapter elaborates on the methods used for each study.

2.5   Methods for Each Study

This part of the chapter offers an overview of the methods employed for each study. It covers the sampling of participants, data collection, data analysis and ethics. A table presents

a summary of this information alongside the design, research questions, journals, and theories. Each study was completed in a specific order to develop the purpose of the research and provide a vision for the overall thesis. The first study (Implementation Effectiveness) was a systematic literature review that researched what had previously been done in the field of implementation science regarding the effectiveness of implementing Indigenous health interventions. Implementation effectiveness informed the second study (Co-design) by identifying gaps in New Zealand regarding the perceptions of co-designing health interventions with Māori communities and the implications of an Indigenous implementation framework. While conducting the Co-design study there was a need to explore the perceptions of disseminating health interventions. Therefore, the third study (Dissemination) investigated the facilitators and barriers to adopting and adapting Indigenous health interventions created by other organisations. After reviewing the data from the three studies it was decided that a survey was needed to generate data on the perceptions of health professionals in New Zealand from different backgrounds and in different roles on the implementation effectiveness of health interventions with Māori communities (Health professionals).

Chapter 2 - Table 1: Overview of the Four Studies

	Study			
Feature	Implementation Effectiveness	Co-design	Dissemination	Health Professionals Perspectives
Title	Implementation effectiveness of health interventions for indigenous communities: a systematic review	Perceptions of co-designing health promotion interventions with Indigenous communities in New Zealand	Identifying the facilitators and barriers in disseminating and adopting a health intervention developed by a community-academic partnership	Implementation effectiveness of health interventions with Māori communities: A cross-sectional survey of health professional perspectives
Focus	Gain insights into the implementation of HPW principles in Indigenous health interventions	Co-designing a health promotion intervention with Māori communities.	Implications of disseminating and adopting a health intervention developed by one group to another	Factors that health professionals rate for implementation effectiveness of health interventions

				with Māori communities.
Nature of Data	Qualitative	Qualitative	Qualitative	Quantitative
Journal	*Implementation Science*	*Health Promotion International*	Under review	*Australian and New Zealand Journal of Public Health*
Research Questions	**RQ1)** How are the elements of the HPW Implementation Framework reflected in studies involving the implementation of a non-communicable disease health intervention in an Indigenous community?	**RQ1)** What are the facilitators of co-designing a health promotion intervention with Māori communities? **RQ2)** What are the barriers of co-designing a health promotion intervention with Māori communities? **RQ3)** What are the advantages and disadvantages of the HPW framework for implementing a health promotion intervention with Māori communities?	**RQ1)** What facilitators do health professionals in New Zealand identify when implementing an intervention designed by others? **RQ2)** What barriers do health professionals in New Zealand identify when implementing an intervention designed by others?	**RQ1)** How do New Zealand health professionals rate the importance of features of implementation effectiveness of health interventions with Māori communities? *a.)* Is there variability in the ratings based on demographics and prior experience with health interventions? **RQ2)** What features are correlated with implementation effectiveness of the health interventions implemented with Māori communities?
Data Collection	Systematic literature review	Semi-structured interviews	Semi-structured interviews	Online Survey
Participants	21 studies	19 health professional and researchers	17 health professionals	200 health professionals
Data Analysis	Coding Scheme	Thematic Analysis	Thematic Analysis	Descriptive Statistics, T-tests, and Multiple regression

2.5.1 Study 1: Implementation Effectiveness

This study was a systematic literature review that examined the implementation effectiveness of health interventions for Indigenous communities using HPW as an evaluation tool. This study was conducted to set a baseline for the overall thesis to identify what has already been done in the field of implementation science for Indigenous health interventions. It was decided that the HPW would be used as an evaluation tool to determine the frequency of which the HPW categories were used in developing and implementing novel health interventions in Indigenous communities. The following paragraphs provide an overview of the methods for the study with the specific details included in Chapter 3.

2.5.1.1 Sampling

A systematic search was completed using multiple databases, clinical trial registries and grey literature to identify relevant studies. I followed the preferred reporting items for systemic reviews and meta analyses (PRISMA) standards for completing a systematic review. PRISMA is an evidence-based set of items for reporting in systematic reviews and can be used as a basis for reporting systematic reviews of research with particular guidelines for evaluations of interventions (Moher et al., 2009). Setting the criteria was crucial in the inclusion of studies as we encountered thousands of articles from the combinations of search terms we used. The inclusion criteria comprised literature that was: peer reviewed, published in English from 2008, evaluated and/or implemented a health intervention targeting Indigenous communities, communities were physical spaces involving Indigenous members who were targeted to benefit from the health interventions and the health intervention had to discuss a non-communicable disease. Studies were excluded if: they were reviews or editorials, the intervention took place in a primary health organisation and only discussed the process of creating and implementing the intervention rather than the evaluation of the intervention process or outcomes. The strict criteria made it easier to decide if the article was relevant to the study or not. It was an iterative process due to adding additional search terms along the way and refining the search. As a new term was added, I would go back through the databases and journals and add the new search terms in to see if there were any new articles that were missed in the previous search. This created a lot of duplicates that had to be manually removed. I sifted through all the titles and abstracts of the articles, and once I had finalised the full-text of studies to be considered, the other co-author and I read the full articles then discuss and decide which pieces were to be included in this study.

2.5.1.2 Data collection and methodological appraisal

Once the articles to be included were identified, the data collection process was completed. We chose to focus on the population, health topic, methods, measures, outcome(s) of the health intervention, who delivered the intervention and data related to the HPW elements. We extracted the relevant data from each articles and put it into a spreadsheet for analysis. We noticed that some articles had information about the implementation process that were in other papers; therefore, we also pulled data from cited articles in the studies that provided the required information about the methods or the intervention. These extra articles were not counted as additional studies as they were discussing the same intervention.

A methodological appraisal was conducted to evaluate the quality of the research methods. We decided to use the Joanna Briggs Institute System for the Unified Management, Assessment and Review of Information as it includes appraisal criteria for different study designs that we found in the articles: observational studies, randomised trials and qualitative studies. To ensure both authors were satisfied with the categories each study was placed in, we did a blind evaluation where we each categorised the studies. Then we discussed with each other the rationale for the category until we reached an agreement on where they were best fit. Similar to the categories each study was placed into, we carried out the methodological appraisal separately then discussed our results and came to an agreement on each study and the most appropriate appraisal.

2.5.1.3 Data analysis/synthesis

We analysed the data extracted from the articles through the HPW framework. This was done by assessing each article based on the key constructs of the framework. Both authors examined the data for HPW constructs which required us to be able to identify those elements (e.g., shared decision making for community engagement). Given that this study was for my thesis, I analysed the data first and had it checked by my co-author to ensure that my analysis was inclusive of all the relevant information. As we analysed the data we realised given the excessive amount of data, it would be beneficial to present the findings in a table making it easier for the reader to follow. A qualitative synthesis then provided an overview of how each of the four HPW elements were reflected in the studies. We also needed to clarify that we were applying the framework post-hoc which meant that we could only analyse the data that was available to us through the information provided on the articles we found. It is possible that the

respective projects had information that was not published that may have changed our assessment of each category. We noted this in our limitations as it may not have been the author's intention to discuss all key constructs of the HPW framework in the study they published.

2.5.1.4 Ethics

There was no ethical requirement for this study as there was no human interaction in the data collection process. Therefore, there was no ethics application submitted.

2.5.2 Study 2: Co-design

Following on from the systematic literature review, I wanted the next study to explore the notion of 'co-design' and how it is currently being interpreted and used when implementing Māori health interventions. The systematic review found that participatory approaches such as CBPR were prominent in the studies and thus unpacking these approaches was an appropriate next step. Co-design is a popular description in New Zealand for various types of participatory approaches. Therefore, this study aimed to explore the perspectives of health professionals and researchers in New Zealand about the facilitators and barriers of co-designing health interventions with Māori communities. This study was also created as a result of the HPW research project mentioned earlier; the project conducted nine initial interviews in an effort to define a Māori implementation science platform. Those initial interviews also identified co-design as a key theme although we decided that those interviews needed to be further developed and analysed to explore the potential facilitator and barriers. To align the study with the HPW project, this second study for the thesis examined the advantages and disadvantages of the HPW framework when co-designing a health promotion intervention.

2.5.2.1 Sampling

The sampling criteria for participants in this study were stakeholders who were researchers or health professionals who had an interest or influence related to health improvement for Māori communities. Initially I only wanted to focus on the perspectives of Māori health professionals as I wanted to prioritise their voices in my thesis. However, I realised in doing so I would be excluding the perspectives of many other health professionals who regularly engage in co-designing health interventions with Māori communities. While it is important to prioritise the voices of Māori in my research, I also wanted to try and provide

an unbiased reflection of the health professionals working with Māori. It is also well documented that Māori health professionals tend to be pro-co-design as a result of Kaupapa Māori philosophies. Therefore, I included non-Māori in the study to investigate their perspectives as well. I decided to use snowball sampling as I was still in the early stages of my research and lacked connections to draw on for possible participants that met the inclusion criteria. Through the interviews conducted participants would suggest other health professionals/researchers they believed met the criteria and would be interested in taking part in my research. This proved to be very beneficial for this study as many participants were recruited through this method. Overall, 19 participants were interviewed.

2.5.2.2 Data Collection

The data collection for this study was semi-structured interviews and occurred in two stages. Semi structured interviews were employed because they allow the participants to share their stories, whether it is cultural or not, in a safe environment that will bring no harm to them. They allow for a good flow of conversation that encourages the interviewee to partake in the discussion while also staying on topic. The nine initial interviews conducted by the HPW project explored the facilitators and barriers of developing a Māori implementation science platform. From these initial interviews one theme that continuously kept re-occurring was 'co-design'. Members of the HPW project team felt the data collected from these interviews needed to be further explored and discussed so a new interview guide was developed and specifically focused on the facilitators and barriers in co-designing Māori health promotion interventions. Given this study was funded by the HPW project and the use of HPW in framing this thesis, the remaining 10 interviews had a particular focus on the elements of the HPW framework. We felt that we needed to develop the interview guide because the first nine interviews allowed an open discussion, where we felt we needed a focussed approach to specifically explore co-design with HPW elements. In addition to the 19 participants, I had one participant retract their interview for personal reasons which I respected and deleted their audio file and transcript from my devices. All interviews followed a Kaupapa Māori methodology incorporating a karakia if the participant was comfortable with that, mihimihi of the interviewer and interviewee, the use of both Māori and English languages, and signed consent forms acknowledging the interviewees permission and highlighting the interviewers' intention. All of these practices incorporate Kaupapa Māori elements and facilitate an open environment for the participant to share.

2.5.2.3 Data Analysis

Thematic analysis was used for this study as it is a flexible approach that has proven to be beneficial in other Kaupapa Māori studies. Thematic analysis is a preferred method of mine as it allows me to centre the study on the perspectives of the participants. The findings from a thematic analysis are driven by the participants, not the intentions of the researcher. I was fortunate to receive funding from the HPW project to pay for professional transcribers. The transcribers had to be amongst the University of Waikato approved transcribing services to ensure a high quality of service and confidentiality for the participants. After the interviews were transcribed I went through and coded each transcript line-by-line. This involved going through the transcripts and highlighting key points participants were making throughout the interview. The hardest part of coding is remaining unbiased when reading through the interview transcripts. After analysing a quarter of the interviews, it can be easy to fall into the habit of searching the transcripts for similar points that have previously been identified in the earlier transcripts. The danger in this is missing or neglecting crucial new points participant have made which could affect the outcome of the key themes identified. This is why the line-by-line approach was used, to ensure each piece of data was coded and analysed correctly. Once the transcripts were coded, they were reviewed to identify key themes. This process included reviewing and comparing the content to check for consistency in key points made. The analysis was conducted by the lead author and the themes and supporting quotes were discussed and confirmed by the other authors in the editing stages of the write up of the manuscript.

2.5.2.4 Ethics

I was not required to apply for ethics for this study as it was previously granted through the HPW project and their ethics application. The project received ethics approval by the Waikato Management School at the University of Waikato which included general and culturally specific research ethics protocols (WMS 15/202).

2.5.3 Study 3: Dissemination

Thinking back to the Māori Implementation Science figure in Chapter 1 that guides this thesis and the studies I had completed up to this point, I needed to research the implications of disseminating health interventions in Māori and non-Māori communities. Study 1 had implications for the HPW framework, and Study 2 identified facilitators and barriers of co-designing health interventions with Māori communities. Therefore, I wanted this study to

explore another aspect of the figure in Chapter 1 and that was to be dissemination. For that reason, this study was designed to explore the facilitators and barriers in disseminating and adopting a health intervention developed by one community organisation to another community organisation. This study was established off the back of the Kaumātua Mana Motuhake (KMM) project; the project team wanted to research the possibility of disseminating the KMM programme in both Māori and non-Māori communities. I worked with the project team for part of the creation and implementation of the programme and through this study I was able to contribute to the dissemination aspect of the project as well.

2.5.3.1 Sampling

The inclusion criteria for participants was set by the project team; they were interested in the perspectives of social service professionals who worked in Māori and non-Māori health organisations throughout New Zealand. Similar to the co-design study, I initially only wanted to interview Māori participants and prioritise their voices. However, for the same reasons discussed in the previous study non-Māori perspectives were also included. Participants who were not Māori needed to be at least serving Māori/Māori communities. It was decided by the other co-authors and I that participants were not required to have previous knowledge or engagement with the KMM as this could be discussed prior or during to the interview. This was beneficial in recruiting participants as it opened the pool of potential interviewers significantly. Recruitment for this study was also through snowball sampling. Potential participants were contacted via email and phone calls and those who responded also provided other participants they believed would be able to contribute to the study. An unforeseen barrier that occurred in the recruitment of participants was COVID19. Many potential participants were unable to take part in the study as their roles/jobs were crucial in managing the effects of COVID19 and serving their communities. Therefore, I was grateful for those who could spend an hour or so of their time with me to discuss this study. A total of 17 participants were included in the study.

2.5.3.2 Data Collection

Semi-structured interviews were also employed for this study for the same reasons in the previous study. Since participants were both Māori and non-Māori, semi-structured interviews allow the participants to share their stories in a safe environment with no judgement or prejudice from the interviewer. Alongside a structured interview guide, they also allow for

a good flow of conversation that stays relevant to the topic of discussion. The interview guide had three key sections. The first section investigated the general experiences of adopting/adapting health interventions designed by others. The second section is where participants shared their perceived facilitators and barriers in implementing health interventions designed by others. Finally, the third section explored the general perceptions of adopting/adapting the specific KMM project within participants' organisations. The interview guide was specifically designed to answer the research questions of the study and provide detailed feedback for the KMM programme. Ten of the interviews were conducted during the COVID19 pandemic and given the restrictions of lockdown those interviews were conducted either over the phone or through zoom. The phone and zoom interviews meant I was able to safely conduct my interviews in a time when the whole world was in lock down and allowed minimal face-to-face interaction. The other seven interviews were conducted face-to-face either before or after the lockdown period when it was safer for those interactions to occur. Regardless of the method of data collection, like the previous study I was deliberate in ensuring Kaupapa Māori principles were upheld in each interview; offering a prayer, mihimihi, the use of both Māori and English languages and signed consent forms.

2.5.3.3 Data Analysis

Given this was an exploratory study, thematic analysis was employed to provide a rich and detailed breakdown of the data collected. As noted in the previous study, thematic analysis complements the principles of Kaupapa Māori by ensuring all the data is evaluated in the coding process. I received enough funding from the KMM project to pay for over half of the interviews conducted to be professionally transcribed by a University of Waikato approved transcription service and the other half I transcribed myself. A downfall in using a transcription service is their lack of understanding of the Māori language. In many of the professionally transcribed documents I had to manually go through and insert the Māori dialogue that had been missed or difficult for the transcribers to understand in the audio files. While that task was time consuming, it did offer another opportunity to listen to the interviews before the coding took place. Once all the documents were completely transcribed, the coding process began which consisted of going through line-by-line highlighting the key points participants made. Re-occurring patterns were put into a table to develop key themes and to be used as direct quotes for support in the write up of the manuscript. I analysed the data and created the key themes which were later edited and confirmed by the other co-authors of the study.

2.5.3.4 Ethics

Ethics for this study occurred in two parts. The KMM project initially received ethical approval for the wider project from the Faculty of Māori and Indigenous Studies at the University of Waikato. Although my study was tied to the project, there were some aspects of my study that required another ethics application to be submitted to the same committee. In preparing my ethics application I prepared and submitted an ethics application containing a new information sheet, consent form, interview guide and cover sheet. Ethics was approved by the convener of the ethics committee on the 15th of April 2019 (FMIS 15/19)

2.5.4 Study 4: Health Professionals Perspectives

From the three previous studies my thesis had accumulated data analysing what has previously been done in Indigenous implementation effectiveness (Implementation Effectiveness), the process of creating Māori health interventions (Co-design), and the dissemination of health interventions (Dissemination). I wanted my final study to investigate the current perspectives of those who are directly involved with the implementation of Māori health interventions in New Zealand. It was important to include health professional perspectives as they are the frontline individuals who are carrying out the tasks of implementing the interventions. This final study was an effort to identify gaps in the implementation process they may have been missed or only lightly touched on in the previous studies. Therefore, this study was a cross-sectional survey that was created to identify the perspectives of New Zealand health professionals on the implementation effectiveness of health interventions for Māori communities.

2.5.4.1 Sampling

We decided to employ Qualtrics to administer the survey for this study as it has access to a diverse range of participants and ensure a high quality of data collected. Given I was still working on/writing up the other studies for this thesis, employing Qualtrics also relieved the pressure of having to recruit 200 participants that met our inclusion criteria in a time efficient manner. Qualtrics assigned a project manager to our study who we worked closely with to define the sampling frame, finalise the criteria for the panel and input the survey into their systems. The sampling frame for this study was a panel of all healthcare workers in New Zealand. For this study, I wanted a diverse range of roles and ethnicities included in this study as the previous studies mainly focused on health professionals and researchers who have more

involvement in the design of the interventions. I wanted this study to include the perspectives of those who are given (or may be given) an intervention to directly implement in the communities in which they work. Qualtrics had a panel of nearly 4,600 from different areas of the healthcare workforce. The final inclusion criteria we provided for Qualtrics was healthcare workers in: medicine/nursing, community health, health management and related functions, allied health, and support workers. Qualtrics explained their own strict processes for determining panel members which assured us that the responses we would receive would be aligned with our sampling frame and met criteria for quality responses.

2.5.4.2 Recruitment

Our project manager explained Qualtrics processes to us and provided opportunities for us to correct or improve our study sample. Once the survey was confirmed and uploaded to the Qualtrics system a soft launch of the survey was conducted to gather approximately 10% of the sample size. From this soft launch, we were able to review the data of those who had completed the survey and get an indication on the characteristics of the participants and the quality of the data. This proved to be very beneficial for us as there were two main discrepancies from the soft launch data. Firstly, there were a couple of questions that were not formatted correctly which affected the results from the data. These needed to be corrected to ensure we acquired all the information we needed from the participants and to allow for better flow of the survey. Secondly, we had concerns regarding the demographics of the sample. The sample seemed to heavily favour women, New Zealand Europeans and community health workers. Regardless of only a 10% sample size, we expected more diversity amongst the ethnicities and roles of the participants. The project manager assured us that the demographics of the sample would balance out as more responses came in. When the survey went live they provided us with demographic updates and prioritised responses from men and other ethnicities to ensure diversity amongst the sample. I was expecting more Māori participants and enquired if it was possible to ensure at least 15% of the sample are Māori, they could provide us a minimum of 15 responses but they could not commit to any specific numbers. However, they assured us they would be putting their best efforts in to reach a sample we were satisfied with and achieved that with a sample of 200 participants that was representative of the sampling frame.

2.5.4.3 Measures

Creating a survey to this extent was new for me. The items and measures required a lot of editing before we reached the stage of uploading it to Qualtrics systems. The current research employed Kaupapa Māori in the selection of questions. The measures and items were selected and informed by the extant literature that is consistent with prior implementation science literature, particularly that which is based on Kaupapa Māori methodology. It was important that both authors have previously worked with Kaupapa Māori methodology and value the framing it brought to this study. Firstly, to ensure all the participants who were taking part in the study had experience in working with Māori patients or communities we included a screening question at the beginning of the survey where that responded no was removed from the study. We decided there were three key areas that we wanted to examine and so the measures needed to reflect that. The three key areas were; 1) participants' general perceptions of five factors for effectively implementing health interventions with Māori communities, 2) participants' direct experience of implementing health interventions with Māori communities (with the same five factors), and 3) generic demographic information. The five factors in the first and second sections were: a) the characteristics of the intervention; b) the process of creating the intervention; c) the organisation implementing the intervention; d) the community the intervention was intended for; and e) the individual involved in the implementation of the intervention. Items in each factor were either adapted from various sources or created for this study. The first section of the survey was focused on participants' perceptions while the second section focused on participants' direct experience. This was important to us to see if there would be any significant difference between the perceptions of those with and without direct experience in implementing health interventions with Māori communities. The second section began with another screening question that asked participants if they had direct experience with implementing health interventions with Māori communities, as opposed to just treating them. If they responded yes, they answered questions about their direct experiences around a shortened set of questions in each of the five areas from the first section. If they responded no, they continued to the third section of the survey. The second section also included an additional factor that examined the implementation effectiveness of the intervention that was implemented. All these measures, sections, and factors helped to structure the survey so that it would generate the data we were targeting to analyse.

2.5.4.4 Data Collection

We worked closely with Qualtrics during the data collection for this study. The survey was conducted online through Qualtrics where participants were sent a link via email to participate in the survey. Qualtrics randomly selected participants who matched the inclusion criteria and those that were previously invited, but did not start or dropped out of the survey, a reminder e-mail was sent. All participants who completed the survey received an incentive for their participation. We intended to provide participants with an incentive and Qualtrics ensured appropriate incentives were allocated to those who participated. An advantage of employing Qualtrics is the data scrub they conduct to ensure rich quality of data collected. Their team remove all survey responses that were incomplete, show automated responses or show signs of completing the survey too quickly indicating superficial responses.

2.5.4.5 Data Analysis

This study was guided by Kaupapa Māori methodology as its main goal is to ensure the research conducted has positive outcomes for Māori communities. Therefore, the interpretation of the results was centred on addressing implementation effectiveness and health equity to benefit Māori communities. All the statistical analysis was completed through SPSS software. I ran all the statistical analysis and had it checked and verified by the other co-author. A range of statistical analyses were employed; factor analysis for factorial validity, checking of internal consistency, independent sample t-tests, oneway ANOVA, paired sample t-tests and multiple regression. At first the statistical analysis proved to be a challenge as all the previous studies required qualitative data analysis which is an approach in which I am more confident. Analysing quantitative data was new to me; however, once I understood the processes it was easier to interpret the data presented and I became competent at the analyses.

2.5.4.6 Ethics

The research ethical procedures for this study were approved by the Human Research Ethics Committee at The University of Waikato (HREC2019#87). In preparing my ethics submission I presented an ethics application containing an information sheet, a draft survey, a draft of the email to recruit participants, and a cover sheet. The initial application was returned with recommendations for technical amendments. Once I made the adjustments and re-submitted the ethics application it was approved by the chairperson of the University of Waikato Human Research Ethics Committee.

2.6 Conclusion

In conclusion, this thesis highlights the importance of including Indigenous methodologies and methods when researching Indigenous health topics in an effort to improve health equity. The use of Kaupapa Māori methodology in this thesis provided fundamental protocols that acknowledge the history, language and values of the Māori culture. It is important as a researcher to ensure that no harm comes to the communities involved in the research and Kaupapa Māori works to provide a safe environment where participants feel safe and share freely without judgement. Furthermore, using HPW in conjunction with Kaupapa Māori strengthens the foundation for enhancing the implementation of health interventions for Māori and all other Indigenous communities. Finally, the choice of a PhD with publications presented the opportunity to include many research designs through individual studies published as a part of the larger PhD thesis. Regardless of the mixed methods used in this thesis, they were all guided and shaped by Kaupapa Māori methodology and the HPW implementation framework.

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Chapter 3: Implementation Effectiveness of Health Interventions for Indigenous Communities: A Systematic Review

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Implementation effectiveness of health interventions for indigenous communities: a systematic review

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Abstract

Background: Translating research into practice is an important issue for implementing health interventions effectively for Indigenous communities. He Pikinga Waiora (HPW) is a recent implementation framework that provides a strong foundation for designing and implementing health interventions in Indigenous communities for non-communicable diseases around community engagement, culture-centred approach, systems thinking and integrated knowledge translation. This study addresses the following research question: How are the elements of the HPW Implementation Framework reflected in studies involving the implementation of a non-communicable disease health intervention in an Indigenous community?

Methods: A systematic review was conducted using multiple databases. Studies were included if they involved the implementation or evaluation of a health intervention targeting non-communicable diseases for Indigenous communities in Australia, Canada, New Zealand or the United States of America. Published quantitative and qualitative literature from 2008 to 2018 were included. Methodological appraisal of the included articles was completed using the Joanna Briggs Institute System for the Unified Management, Assessment and Review of Information. Data on the population, topic, methods, and outcomes were detailed for each individual study. Key data extracted included the HPW elements along with study characteristics, who delivered the intervention and health outcomes. Data analysis involved a qualitative synthesis of findings as guided by a coding scheme of the HPW elements.

Results: Twenty-one studies were included. Health topics included diabetes, nutrition, weight loss, cancer and general health. The key themes were as follows: (a) two thirds of studies demonstrated high levels of community engagement; (b) from the culture-centred approach, two-thirds of studies reflected moderate to high levels of community voice/ agency although only a third of the studies included structural changes and researcher reflexivity; (c) about a quarter of studies included multi-level outcomes and activities consistent with systems thinking, 40% had individual-level outcomes with some systems thinking, and 33% included individual-level outcomes and limited systems thinking; and (d) almost 40% of studies included high levels of end user (e.g., policy makers and tribal leaders) engagement reflective of integrated knowledge translation, but nearly half had limited end-user engagement.

Conclusions: The HPW Implementation Framework is a comprehensive model for potentially understanding implementation effectiveness in Indigenous communities. The review suggests that the studies are reflective of high levels of community engagement and culture-centredness. The long-term sustainability and translation of evidence to practice may be inhibited because of lower levels of systems thinking and integrated knowledge translation.

Registration: Not registered

Keywords: Indigenous communities, Health interventions, Non-communicable diseases, Implementation framework, Community engagement

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Background

Each year, billions of dollars are spent around the world to support the development of evidence-based health interventions for non-communicable diseases designed to improve human health and reduce health inequities [1, 2]. Only a small fraction of these interventions are ever successfully implemented into practice [3], and efforts to implement these practices can take many years [4]. The translation of evidence-based guidelines into practice is one of the most challenging problems in health care and disease prevention [5]. Despite extensive public health research on the efficacy and effectiveness of health promotion and disease prevention strategies, methods for disseminating these interventions and encouraging their implementation and wide-spread adoption are not well developed or evaluated [5].

Further, little progress has been made in reducing inequities despite the fact that there is strong evidence supporting intervention effectiveness in regards to non-communicable diseases [6]. Researchers acknowledge the need for implementation science and translational research for achieving health equity and have identified key issues including context, culture and levels of acceptance as central to the problem of the utilisation of evidence-based practices [7, 8]. Translation, dissemination, uptake and implementation are becoming increasingly important to transition innovative health research into health policy and practice and ultimately achieve health equity for Indigenous populations [3, 7].

Indigenous populations around the globe face inequities compared to non-Indigenous populations [9, 10]. For example, one study found inequities between Indigenous and non-Indigenous populations in relation to life expectancy, child obesity, adult obesity, educational attainment and economic status [10]. Achieving health equity requires addressing a complex array of contextual and cultural features along with the unjust distribution of social determinants in health rather than simply focusing on intervention efficacy [7, 8]. For example, Indigenous perspectives on holism and wellbeing are based on cultural values, beliefs and traditions passed down the generations, including beliefs in the unity of mind, body and spirit [11]. Indigenous cultures frequently believe that all life is interrelated including the environment and the universe and that holism is the most appropriate way to understand health and wellbeing [12, 13]. Thus, when implementing an intervention with an Indigenous community, the intervention needs to be culturally appropriate and relevant as well as supported and owned by the community [2, 14].

A recent implementation framework provides a strong foundation for understanding the key principles for developing and implementing non-communicable disease health interventions with Indigenous communities. The

He Pikinga Waiora (HPW; Enhancing Wellbeing) [15] is a theoretical framework that fills a gap in regards to the lack of implementation models for Indigenous communities, which may help account for the underwhelming progress made in reducing health inequities [16]. HPW is built on a strong international evidence base for best practice in developing and implementing health interventions [15]. Specifically, it argues that implementation science for Indigenous communities should be grounded in Indigenous knowledge, participatory approaches and systems thinking and includes four elements: culture-centred approach, community engagement, systems thinking and integrated knowledge translation.

First, implementation should be guided by the culture-centred approach (CCA). The CCA argues that social structures of health can be transformed by providing opportunities for community voice/agency, reflexivity among researchers, and providing resources to address structural challenges [17, 18]. This transformation is achieved through asserting Indigenous self-determination, challenging power imbalances and health researchers/professionals being reflexive and adjusting their behaviour to enhance cultural safety [15, 19]. Such an approach helps to ensure Indigenous cultural perspectives are part of the definition of the problem and integrated into the interventions to facilitate implementation effectiveness and address health equity [20].

Second, high levels of community engagement (CE) are associated with greater implementation effectiveness and improved health outcomes and health equity [21, 22]. CE is a process of collaborating with groups directly affected by a particular health issue or with groups who are working with those affected [23]. CE ranges from very limited community involvement to community ownership and management through five categories: outreach, consultation, involvement, shared leadership and community-driven [24, 25]. High levels of CE are reflected through shared decision-making and communication among researchers and community members which helps with sustainability, capacity building and long-term health outcomes [26, 27].

Third, systems thinking (ST) helps to address the complexity of the local contexts and the variety of levels and determinants of health problems [28, 29]. ST also facilitates new framings and strategies that are associated with improved project and health outcomes including health equity [29, 30]. It allows for new ways of thinking for researchers, practitioners and community members through considering different perspectives, relationships among people/facets of the health system and multiple level of analysis [30]. ST also acknowledges holistic perspectives towards health problems and examines the inter-relationships of the various parts that need to be understood within a larger context [29]. It is important to note that

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ST is frequently used and has many different approaches to conceptualising such as complex systems dynamics. As a result, there are no clear guidelines for implementation in practice [31, 32]. The HPW framework specifies key ST elements that may serve as guidelines for implementation of health interventions for Indigenous communities including multiple perspectives, relationships and levels of analysis along with feedback loops.

Finally, integrated knowledge translation (IKT) emphasises co-design and co-production with end users in developing and implementing an intervention for the purpose of transferring knowledge and enhancing sustainability [33, 34]. End users are the people who will use research findings and facilitate the translation from research to practice [35]. These may be clinicians, policy makers, tribal leaders and systems administrators. IKT involves the researchers and end users working in various levels of partnership to ensure there is shared ownership and that many barriers to implementation and translation can be addressed early in the design process [33, 36]. For Indigenous communities especially, IKT also needs to ensure there is benefit for the community reflected in the knowledge of the community [37].

The purpose of this study is to conduct a systematic literature review of articles that involved the implementation of a non-communicable disease health intervention in an Indigenous community. Systematically reviewing the literature will provide insights regarding how the HPW principles are currently being implemented and reported in Indigenous community-based health interventions. This study applies the HPW framework in a post hoc manner to identify the patterns in intervention development and implementation with Indigenous communities.

Methods

The systematic review was completed using PRISMA guidelines [38] (see Additional file 1 for the checklist). Our primary research question was the following: How are the four elements of the HPW Implementation Framework reflected in studies involving the implementation of a non-communicable disease health intervention in an Indigenous community? This question relies on the post hoc application of the HPW framework to studies that did not directly use it. The rationale for this choice is that there is not an existing framework guiding implementation science of Indigenous health interventions. The HPW framework was recently developed and has a strong theoretical and empirical basis and its post hoc application enables us to examine whether these key elements are being used by researchers and implementers; if so, they can help identify promising practices for researchers and practitioners working in similar communities. If they are not being used, it may illustrate important directions for future research and practice. The

HPW framework, previously applied in a post hoc manner, provided insights demonstrating associations between the implementation of framework principles and health outcomes in type 2 diabetes prevention for Indigenous people in primary care [15].

Inclusion and exclusion criteria

The chosen literature was peer reviewed and published in English since 2008. This time period was selected to provide relatively recent insights to implementation effectiveness and provide a sufficient literature base to review. Literature was only considered if it evaluated and/or implemented a health intervention targeting Indigenous communities. Communities are physical spaces involving Indigenous members who were targeted for benefit from the health intervention. The specific interventions included in this study were those that discussed non-communicable diseases.

The search exclusion criteria eliminated articles that were reviews or editorials. Further, the article was excluded if the intervention took place in a primary health organisation or was based on another aspect of the primary health system. Additionally, school-based interventions were excluded unless the school-based intervention was part of a larger implementation into the community (e.g., involving larger health promotion and community intervention). Literature was excluded if the study population was not Indigenous and if there was no intervention implemented. Literature was also excluded if it only discussed the process of creating and implementing an intervention rather than evaluation of the intervention process and/or outcomes.

Search strategy

EBSCOhost, Emerald Insight, ProQuest Central, Pubmed and MEDLINE databases were the selected search engines. The key search terms were community health, Māori, First Nation, Aboriginal, Native American, Indigenous and intervention. The search consisted of combining two or three search terms to reveal specific articles that were relevant to the study. The following sequences were the search combinations used for this study: "community health" and "Māori"; "community health" and "Māori" and "intervention"; "community health" and "Indigenous"; "community health" and "Indigenous" and "intervention"; "community health" and "First Nation"; and "community health" and "First Nation" and "intervention"; "community health" and "Aboriginal"; and "community health" and "Aboriginal" and "intervention"; and "community health" and "Native American"; and "community health" and "Native American" and "intervention". The terms were searched in the article title, abstract, the whole article and the keywords. Literature from each individual search was exported to

an EndNote file to identify and eliminate the duplicate articles. Once the duplicates were removed, the study selection process began.

Study selection was completed by the two authors. Titles and abstracts were completed by the first author with consultation with the second if there were uncertainties. The full-text articles were independently reviewed by both authors using the exclusion criteria. After completing the study selection, additional records were identified using three means to locate any missed published or unpublished studies and thus reduce the risk of publication bias [39]. First, a manual search of references from the included articles was undertaken. Second, a search of the grey literature was completed using the search terms in Google. Third, three clinical trial registries (Australia New Zealand Clinical Trials Registry, Health Canada Clinical Trials Database and ClinicalTrials.gov) were searched using key Indigenous-related search terms (e.g., First Nations). Relevant trial descriptions were reviewed; study protocol articles and project names were then searched through Google and Google Scholar to find final study results in published or unpublished form.

Data extraction and methodological appraisal

From the articles that met the inclusion criteria, the selected data for this study were the population, health topic, methods, measures, outcome(s) of the health intervention, who delivered the intervention and data related to the HPW elements. Given that we are using the HPW framework as a post hoc analysis of the articles and also that some published outcome studies have limited information about intervention development, we also extracted data from cited studies in the included articles such as study protocols, supplemental files, web sites or articles that were referenced to provide more information about the study methods or intervention. In two cases, a follow-up publication identified in study selection helped provide additional information about the primary study [40, 41]. We assigned a rating of the quality of details provided in the articles as good, fair or poor. In all cases, the rating was at least fair with the vast majority rated as good (*n* = 17) which allows the comprehensive assessment of each of the HPW elements (see Additional file 2 for information about additional studies consulted and quality of details).

Methodological appraisal of the included articles was completed using the Joanna Briggs Institute System for the Unified Management, Assessment and Review of Information [42]. The study design for the primary hypotheses/study aims were categorised along with three different types: observational, randomised control trials and qualitative. Each individual study was assessed with risk of bias identified. Appraisal criteria are displayed in Table 1. Each criterion was rated as yes, somewhat, no, unknown or not applicable. An overall score was provided for each study using yes =2, somewhat =1 and no or unknown = 0.

Data synthesis

Summary tables were provided for the primary research question and also for the study characteristics. Data about the HPW elements were described using a coding scheme to guide in the inclusion of key elements [15]. The coding scheme was used to recognise key HPW concepts even if they were not directly labelled as such by the study authors (i.e., current authors' interpretation of whether HPW elements were used). The key components for each of the elements include the following: (a) CCA—community voice/agency in defining problem and solution/intervention, researcher reflexivity and resources for structural change; (b) CE—degree of shared decision-making and communication among researchers and community entities; (c) ST—multiple perspectives of causes reflecting holism, complex relationships among ideas and entities and multiple levels of analysis (e.g., micro, meso and macro); and (d) IKT—co-design and implementation of intervention with end users. Data were then qualitatively synthesised to provide an overview of how each of the four HPW elements was reflected in the 21 studies.

Data on the population, topic, methods, and outcomes were detailed for each individual study. Individual study results include measures of change and significance values. Given the heterogeneity of study characteristics, measures and outcomes, meta-analysis—or even simple quantitative associations—was not possible. Following a previous systematic review, outcomes were categorised in two ways: (a) having at least one statistically significant change in a primary outcome and (b) having statistically significant changes in 50% or more of the primary outcomes [43]. Additional file 3 presents the study characteristics and outcomes.

Results

Study selection

Figure 1 shows the search strategy identified 6981 articles from the listed databases; articles were downloaded to EndNote to remove a total of 3590 duplicates. Upon screening for inclusion criteria in titles and abstracts, the full text of 86 articles was independently reviewed. After review using the exclusion criteria, 19 articles were included for analysis. The additional record search resulted in two additional articles for a final total of 21.

Methodological appraisal

Table 1 provides a summary of the results of the appraisal. There were seven observational studies: four from the

Table 1 Methodological appraisal of studies

Observational Studies	Benyshek et al., 2013	Christohper et al., 2008	Coppell et al., 2009	Kaholokula et al., 2014	Kakekagumick et al., 2013	Reilly et al., 2011	Shah et al, 2015
1) Was the study based on a random or pseudo-random sample?	N	Y	Y	N	N	N	N
2) Were the criteria for inclusion in the sample clearly defined?	Y	Y	Y	Y	N	Y	Y
3) Were confounding factors identified and strategies to deal with them stated?	N	N	S	Y	N	Y	N
4) Were outcomes assessed using objective criteria?	Y	N	Y	Y	Y	Y	Y
5) If comparisons are being made, was there sufficient description of the groups?	N/A	N/A	Y	Y	N/A	N/A	N/A
6) Was follow up carried out over a sufficient time period?	S	Y	Y	S	Y	Y	S
7) Were the outcomes of people who withdrew described and included in the analysis?	Y	N	N/A	N	N	N/A	N/A
8) Were outcomes measured in a reliable way?	Y	S	Y	Y	Y	N	Y
9) Was appropriate statistical analysis used?	Y	Y	Y	Y	Y	N	Y
Total	11/16	9/16	15/16	13/18	8/16	8/14	9/14

Randomised Control Trial	Brimblecombe et al. 2017	Canuto et al. 2012	Ho et al. 2008	Kaholokula et al. 2012	Karanja et al. 2010	Kolahdooz et al. 2014	Mendham et al. 2015	Simmons et al. 2008	Sinclair et al., 2013	Tomayko et al. 2016
1) Was the assignment to treatment groups truly random?	Y	Y	N	Y	N	Y	Y	Y	Y	S
2) Were participants blinded to treatment allocation?	Y	N	N	N	N	N	N	N	N	N
3) Was allocation to treatment groups concealed from the allocator?	Y	N	N	N	N	N	N	N	Y	N
4) Were the outcomes of people who withdrew described and included in the analysis?	N/A	Y	N	Y	N	N	N	N	Y	Y
5) Were those assessing outcomes blind to the treatment allocation?	Y	Y	N	U	N	N	N	N	N	N
6) Were the control and treatment groups comparable at entry?	Y	S	Y	Y	Y	Y	Y	Y	Y	Y
7) Were groups treated identically other than for the named interventions?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
8) Were outcomes measured in the same way for all groups?	Y	Y	Y	Y	Y	Y	Y	N	Y	Y
9) Were outcomes measured in a reliable way?	Y	Y	S	Y	Y	Y	Y	Y	Y	Y
10) Was appropriate statistical analyses used?	Y	Y	Y	Y	Y	Y	Y	S	Y	Y
Total	18/18	15/20	9/20	14/20	10/20	12/20	12/20	9/20	16/20	13/20

Qualitative Studies	English et al., 2008	Sushames et al. 2017	Townsend et al. 2016	Tumiel Behalter et al. 2011
1) Is there congruency between the stated philosophical perspective between the research and the methodology?	Y	Y	Y	Y
2) Is there congruity between the research methodology and the research question or objectives?	Y	S	Y	S
3) Is there congruity between the research methodology and the methods used to collect data?	Y	Y	S	S

Table 1 Methodological appraisal of studies *(Continued)*

4) Is there congruity between the research methodology and the representation and analysis of data?	S	Y	N	N
5) Is there congruity between the research methodology and the interpretation of results?	Y	Y	Y	S
6) Is there a statement locating the researcher culturally or theoretically?	N	N	N	N
7) Is the influence of the researcher on the research and vice versa addressed?	N	N	N	N
8) Are participants and their voices, adequately represented?	S	Y	Y	N
9) Is the research ethical according to current criteria or, for recent studies, is there evidence of ethical approval by an appropriate body?	S	S	S	S
10) Do the conclusions drawn in the research report flow from the analysis or interpretation of the data?	Y	Y	Y	S
Total	13/20	14/20	12/20	7/20

Y Yes, *S* Somewhat, *N* No, *U* Unclear, *N/A* Not applicable; Yes scored two, somewhat one; No and unclear are zero with not applicable removed from totals

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Fig. 1 Flowchart diagram detailing the literature search
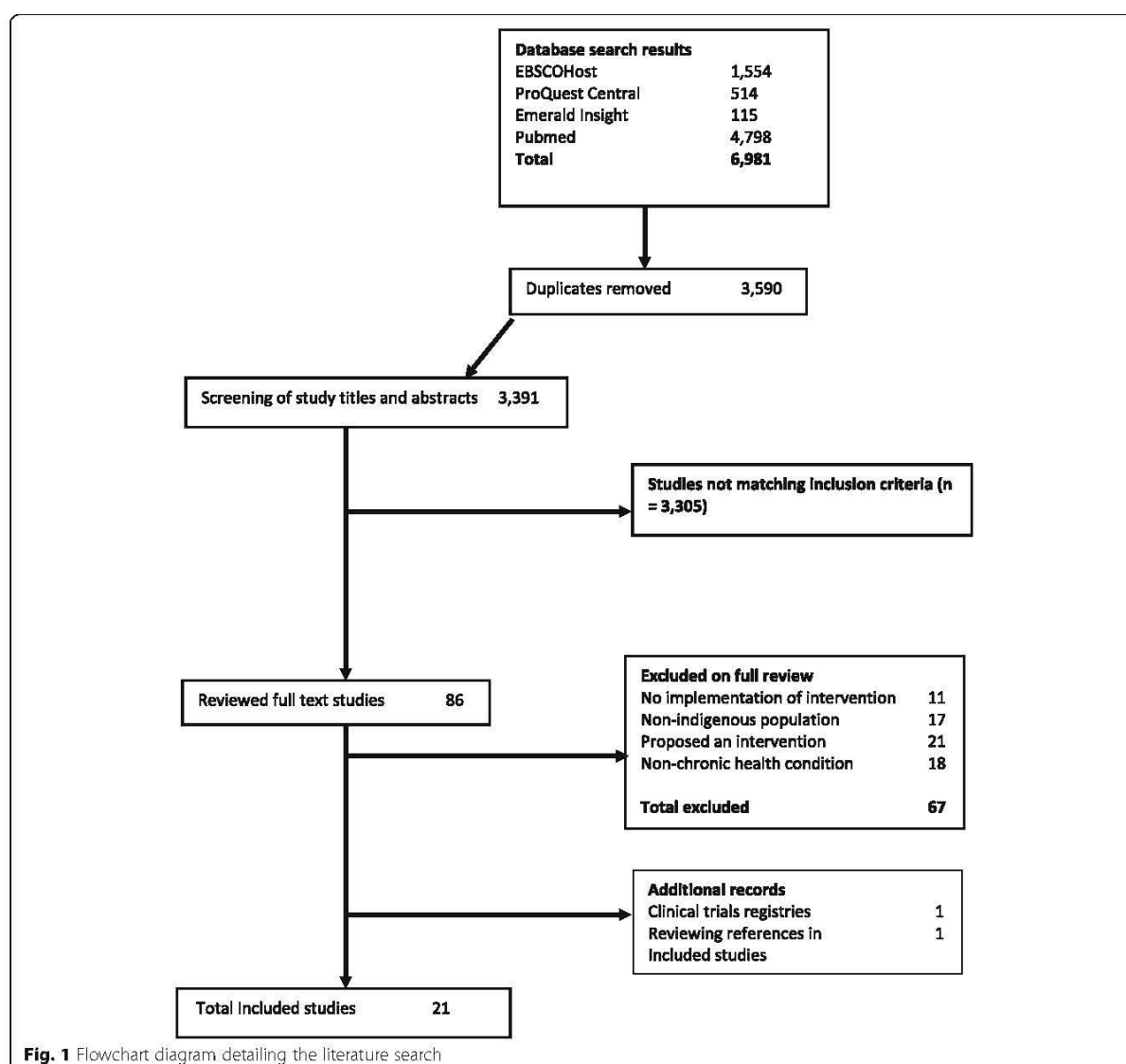
United States of America (USA) [44–47], one from Australia [48], one from New Zealand [49] and one from Canada [50]. The follow-up period ranged from 4 months to 3 years. Three studies had equal or less than 6 months of follow-up which is a potential area for bias [44, 46, 47]. Retention rates ranged from 55–100% although one study included two independent panels [49] and another did not use individuals as the unit of analysis [48]. The major risk of bias in these studies is the lack of a comparison group although this is consistent with the research design. Additional risks include some lack of valid and reliable measures [45, 48], small sample size [44, 50], lack of appropriate statistical analysis [48], incomplete description of the participants and study methods [50] and lack of information about non-

completers [46, 50]. The average study quality rating of observational studies was 68.71% (SD = 15.38).

There were 10 randomised control trials with comparison groups: four from the USA [51–54], three from Australia [55–57], two from Canada [58, 59] and one from New Zealand [60]. Six of the studies randomised individuals to intervention and control/standard care [51, 52, 54, 56, 57, 60], three included random selection of communities to intervention and control [53, 55, 59] and one included selection of communities as well, but it was not clear whether assignment was random [58]. In all but two of the studies, the control group received a delayed intervention [53, 60]. The trial periods ranged from 3–24 months (median 9–12 months) with four studies having less than or equal to 6 months of follow-

up [51, 52, 56, 57]. Four studies reported lower than 70% retention rate (59–66%) [54, 56, 57, 60]. The major risks of bias included lack of blinding in randomisation in all but two studies [51, 55], lack of blinding for assessors in all but two studies [55, 56], lack of inclusion of data from those who withdrew (e.g., intention to treat analysis) in all but four studies [51, 52, 54, 56], incomplete reporting of study results in one study [60], some unreliable measures in one study [58] and a few participants moving from one arm to another post-randomisation in one study [54]. The average study quality rating of randomised control trials was 65.00% (SD = 17.16).

There were four qualitative studies: three from the USA [61–63] and one from Australia [64]. Each of these studies described a health intervention and sought to describe the processes by which the programme was developed and how it impacted outcomes [61–63] or how it related to participation in the intervention [62, 64]. Only two studies directly addressed participant outcomes although those included only descriptive information [61, 62]. A risk of bias is that none of the studies included statements of researcher positionality nor did they discuss the influence of the researcher on the research. Further, two of the studies did not provide any direct quotes thus a risk of bias in that participant perspectives were not included [62, 63]. The average study quality rating of qualitative studies was 57.50% (SD = 15.55).

Study synthesis

The study synthesis addresses the research question about how the HPW elements are reflected in the studies (see Table 2 for the study synthesis). Prior to summarising those findings, Additional file 3 provides a breakdown of the study characteristics that helps to understand the context of the studies. The targeted health conditions included diabetes (48%), obesity/general non-communicable health conditions (24%), nutrition (19%) and cancer (10%). The types of interventions included lifestyle (38%), multi-pronged including individual and community elements (33%), self-management of a condition (14%) and education (14%). Two thirds of the interventions included the delivery of at least one component by a community health worker (CHW). All of the studies that had a measurable outcome variable (n = 19) had at least one primary outcome with a statistically significant and improved change with six studies (38%) achieving significant change in 50% of primary outcomes measures. A slight majority of the studies (52%) were feasibility, pilot or short-term interventions.

For the CCA, there are three key issues to consider: voice/agency, reflexivity and structural change and resources. For voice/agency, there were three patterns identified. The first was studies that reflected community

voice/agency in defining the problem and identifying the solution [45, 46, 48–50, 52, 54, 59, 61]. The second was studies that allowed for adaptation of the solution to fit the culture of the community, but without clear choice that this was an important problem to address [51, 53, 56, 58, 62, 63]. The third was studies that did not allow much input into the problem or solution beyond minor changes or simple approval [44, 47, 55, 57, 60, 64]. Reflexivity of the researchers about power relations and relationships among partners was directly expressed by a little more than 40% of the studies [45, 46, 48, 49, 51, 52, 61, 62], although an additional study did include post-study reflection [60]. Finally, while all of the studies offered resources, only a third of the studies sought structural changes through their interventions in the form of changing policies, systems or organisational/community practice [45, 48–50, 58, 59, 61].

High levels of CE were reflected in two thirds of the studies. The most common engagement approach was the use of community-based participatory research (CBPR) which was directly noted by nine of the studies [44–46, 51, 52, 54, 59, 61, 62] with the remaining studies offering another participatory approach [48–50, 53, 63]. Most of these studies involved community partners or steering/advisory groups that guided the work and had shared decision-making and communication responsibilities with the researchers. There was evidence in these studies that the high level of engagement was included throughout the research process from design/adaptation to implementation and evaluation of the intervention. The remaining studies had relatively limited levels of engagement. Some of these would be best described as an initial consultation to get approval for the project with limited input beyond that stage except to help with recruiting participants [47, 55, 57]. Two of these limited engagement studies stated the use of steering/advisory committees to guide the work and yet the evidence is that these groups were primary for consultation and not shared decision-making [56, 60]. Three additional studies stated they used participatory approaches although with limited evidence of who the partners were or how the studies were in fact participatory [44, 58, 64]. Finally, some of these limited engagement studies utilised CHWs to help with engagement with participants even though other aspects of their project were limited engagement [44, 47, 60].

There were three predominant patterns of ST, which in part are based on the level of behaviour targeted and in part on the perspectives and relationships identified. The vast majority of studies targeted individual behaviour (n = 16; 76%) with both community and individual-levels targeted by three studies [49, 50, 63] and the community-level only in two studies [48, 55]. The studies that targeted some community-level behaviour represent the first

Table 2 Study Synthesis using the He Pikinga Wairoa Elements

Study	Community engagement	Cultural centeredness	Systems thinking	Integrated knowledge translation
Observational Studies				
Benyshek et al. 2013	The intervention was delivered by Native lifestyle coaches and this facilitated connection with participants. The intervention was developed using community-based participatory research (CBPR) methods although specific details on the process are not clear.	Researchers adapted the programme to tailor to urban American Indians. The community was informed and engagement was limited to adapting the intervention; problem definition and solution identification by the community not apparent.	The interview process allowed for feedback loops. The target of change was at the individual level. The systems considered were those that already existed. Limited evidence of systems thinking.	There was no direct discussion with end users other than using CPBR to adapt the intervention.
Christopher et al. 2008	A CBRP approach was used. Strong community involvement at every phase of development and implementation with evidence of shared decision making. Lay health advisors were used to deliver the intervention and were selected by the community.	Both the researcher and community leaders had equal say in the development of the intervention with the community identifying the problem. Intervention was delivered within the structure of the community and provided additional services. Research reflexivity clearly noted in the article.	There was demonstration of good understanding and respecting the community systems. The project altered their intervention based on the feedback received. Messages targeted individuals directly and community indirectly.	Almost every aspect of the intervention was co-created with community members including some community organisations. Engagement with other end users was not directly discussed.
Coppell et al. 2009;	The project had a participatory approach with the community involved in all project phases. A memorandum of understanding (MOU) was established between the researchers and communities before the first attempt of developing a Māori-led diabetes intervention. Community health workers were a key engagement approach with participants.	Researchers completed surveys to assess the severity of diabetes and confirm the communities concerns. The project developed a vision that was shared and owned by the community. The intervention involved multiple structures and provided resources to the community. Researcher reflexivity engaged though the partnership.	The whole community was included. By working with all members of community the intervention impacted the individual, the community and the local stores and businesses, allowing creating opportunities for a positive change at every level. Feedback loops were highlighted as a crucial aspect for this project.	The intervention engaged with stores, schools and local employers to support the intervention structurally (e.g., create school policies consistent with the intervention). The intervention was driven by the community and community leaders. Thus, there was a high-level of engagement with stakeholders and end users.
Kaholokula et al. 2014	The project was part of a CBPR partnership called the PILI 'Ohana Project. This project was a partnership between researchers with five community organisations. Community members and community organisations were integrated in all phases of the research.	The intervention was adapted with community participation and the community helped identify the problem and solution. Researcher reflexivity reflected in an ongoing partnership. Community peer educators helped to make cultural connection with participants.	Equal partnership of community and academic investigators involved from the beginning of the study to integrate the best combination of community and scientific knowledge. Partnership involved multiple aspects of the Native Hawaiian health system. Only individual level of analysis for the intervention.	The partnership includes relationship with the Native health system, community health centres, and grassroots organisations. The CBPR approach offered the benefit of building capacity within the difficult to reach communities in this study. The level of knowledge translation beyond study period is not described.
Kakekagumick et al., 2013	Research project reflects a long-time partnership involving multiple projects guided by community engagement. Research project included shared decision making and communication in all elements of the research over a 22-year period.	The need for the interventions was identified by the community and the various interventions reflect the wishes of the community. Interventions provided new resources and changed existing structures. Reflexivity is noted through reciprocal learning and capacity building.	A number of projects addressed multiple causes of the health issue, accessibility, costs, environment, social support and lack of adequate facilities. Relationships were forged in each phase with community groups, schools, community health services, and sports teams addressing multiple systems levels. Vast array of feedback was received through these relationships that shaped the design, implementation and outcome of the overall study.	The project is a partnership of the Sandy Lake First Nation and researchers. The project has been active for 22 years demonstrating that it is a sustainable model that has transformed the community over time. End users highly engaged in all phases of the research.
Reilly et al. 2011	The project was overseen by a steering committee of senior community and	Initial consultation was conducted with the community around the health and health	The project created a health promotion programme aligned to an ecological	Community representatives on the steering community were members of

Table 2 Study Synthesis using the He Pikinga Wairoa Elements *(Continued)*

Study	Community engagement	Cultural centeredness	Systems thinking	Integrated knowledge translation
	university representatives. They were bound by a MOU between participating organisations that stipulated rules for community ownership and storage of data. The project was implemented by local health workers. Trust between the university researchers and the Koori community had been established over many years as a result of collaboration on previous projects.	determinants of the community. The academic researchers worked closely with community researchers who coordinated the development and delivery of the program. Academic researchers took a supportive role, offering advice and suggestions but only participating directly in planning and design when requested.	approach. It targeted changes in the nutrition environment with the thought that individual behaviour would change (although not directly assessed in the study). Further, multiple aspects of the health promotion and food supply system were considered.	Aboriginal partner organisations. Specific activities involved engagement with end users from these organisations. Intervention strategies were devised in response to each aims following discussions between participating organisations and reflections on previous findings and experiences of participants.
Shah et al. 2015	The lead researcher had a prior relationship with the community although there is no clear partnership identified. Tribal leaders and health programs were consulted. Community health representatives recruited participants and delivered the intervention.	The health issue was identified through surveys with community members. Participants were involved in the development of the intervention through focus groups and a cultural specific education interventions. The researchers made the majority of the final design and implementation decisions.	The intervention aimed to deliver healthcare that emphasized greater autonomy/self-management. The intervention targeted individual behaviour and no other levels considered. Limited evidence of systems thinking.	While tribal leaders and health programs were consulted at the beginning, there is no evidence of ongoing engagement with these end users.
Randomised Control Trials				
Brimblecombe et al. 2017	This intervention utilised grocery stores to implement price discounts for healthy food options and provide nutrition education. The community engagement involved finding communities and stores to take part in the intervention. There was an agreement with the non-profit associations affiliated with the stores and store boards. The researchers talked to store boards to share study protocol and sign an agreement to follow the protocol and help recruit research assistants.	That nature of the problem is well defined although the communities did not select the problem directly or suggest the solution. There is general research evidence suggesting Aboriginal communities wanted this type of intervention. The intervention did provide resources (i.e., discounts) to community members to purchase healthy food.	The research focusses on the larger food system as a potential manner to improving healthy food consumption. The overall project includes evaluation of overall food buying patterns for stores and individual behaviour although this study only includes the larger buying patterns. The study recognises the larger systemic issues and relationships that shape individual consumption patterns although the actual study implementation does not directly include engagement with all of these issues and relationships.	Knowledge translation efforts with end users was minimal. The store boards were consulted although only for approval of the study. This is a top-down approach where the researchers have identified an issue and have developed an intervention they feel is appropriate. No discussion of policy or practice change beyond the study period is identified.
Canuto et al. 2012	The project was guided by an advisory committee made up of local Indigenous women. Some of members were representatives from the collaborating organization and provided input into the interpretation of qualitative data. Participants were recruited based on the intervention requirements.	The committee provided advice on feasibility of the project's procedures and assessments ensuring that all aspects of the project were culturally appropriate. There did not appear to be any direct input on defining the problem although there was input on the solution. Reflexivity not apparent.	The intervention considered a variety of potential factors for programme success. It was focused only on individual level outcomes. Systems levels, relationships and perspectives were not considered at great depth other than barriers for participation.	This intervention development included initial consultation with two community organisations. The focus was more on making sure the intervention was culturally appropriate rather than how to engage in knowledge translation.
Ho et al. 2008	Community engagement was achieved through local organisations helping to facilitate implementation of the project. Decision making and communication was largely directed by the researchers although communities had input that led to adaption of the intervention in the specific locales.	Semi-structured interviews were done with multiple community members to assess acceptability, feasibility and sustainability of the intervention. Thus, some community voice was included to help make the intervention culturally appropriate. There was no direct evidence that the community was able to select the problem	This intervention was implemented into three different systems: school, food store and larger community. It planned to change the systems and provide a healthier outlook for both communities. Multiple stakeholders were included and different perspectives gathered. Feedback loops were supplied during feasibility	The majority of the knowledge integrated at the beginning of the project was from the researchers and project team. Community health workers and researchers expressed a desire to sustain the intervention if supplied with materials so there was some potential knowledge translation activities.

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Table 2 Study Synthesis using the He Pikinga Wairoa Elements *(Continued)*

Study	Community engagement	Cultural centeredness	Systems thinking	Integrated knowledge translation
		to address or how to address it.	testing.	
Kaholokula et al. 2012	The project was part of a CBPR partnership called the PILI 'Ohana Project. This project is a partnership between researchers with five community organisations (health centres, health care systems, and grassroots organisations). Compromises were made by each to ensure the best intervention design for the participants providing evidence of shared decision making and communication.	The partnership provided equal insights about the importance of focusing on diabetes. Feedback on the intervention was gathered in three activities; focus groups, informant interviews, and pilot testing. A steering committee was established and oversaw the translation of a previous diabetes intervention to ensure cultural appropriateness. Delivered by community health advocates to enhance cultural connection. Reflexivity evidenced through ongoing partnership.	The study acknowledged the important role community organisations play in designing and implementing health interventions in Indigenous communities. The partnership involved multiple aspects of the Native Hawaiian health system. Only individual level of analysis for the intervention. Systems where altered for the translation of the intervention, though it is unclear if it is an ongoing change, or if it was only for the period of the intervention.	Changes to the intervention were made based off of community organisation advice and these are key end users in the Native Hawaiian health system. No direct discussion of sustainability of the intervention.
Karanja et al. 2010	Researchers worked with various community representatives to craft and implement the intervention including community health workers. Three communities received the intervention and were able to adapt and tailor intervention plans to fit their communities. There was some sharing of decision making and communication through these intervention plans.	Community members and agency representatives were able to help to craft messages and policies. Structural changes were sought in health and business settings. Whether the community had a say in the definition of problem and choice of health issue is not clear despite clear involvement during the intervention development and implementation. Reflexivity is not discussed.	The intervention targeted community and family-level behaviour. The community level include a variety of elements and perspectives including media messages and policy changes in businesses and health settings. There was opportunity for feedback to adapt intervention plans.	Numerous end users were engaged in the implementation of the intervention. They provided responsibility for implementation of aspects of the community intervention. Sustainability or intention to sustain is not discussed.
Kolahdooz et al. 2014	The intervention development process was a community participatory approach through the use of community workshops and qualitative and quantitative formative research. Shared decision making was enacted through the workshops in deciding the appropriate intervention and intervention messages. No mention is made of community researchers or research partners.	The formative research process provided community voice for identifying the problem. The community workshops ensured there was community voice for the solution. Culturally appropriate research processes and interventions were utilized. Reflexivity is not directly discussed.	The intervention process considered multiple perspectives and stakeholders (from grocery stores, community sites and health organisations). Effort was made towards changing the systems that usually promote unhealthy food and eating habits. Relationships among the organisations and larger system were noted in developing a healthy food environment. Intervention targeted community, organisation and individual levels.	Community voice was integrated from the beginning and knowledge translation efforts included participation from community members, local leaders, government health workers and grocery shop staff. There was no mention whether these efforts led to sustainability of the intervention.
Mendham et al. 2015	The intervention was designed and implemented by the project team with minimal engagement from the community. Community organisations were utilised for recruitment of participants. The authors noted development of interventions by the community increased ownership yet never described any engagement efforts.	The intervention was developed to fit communal values by focusing on group-based and sports activities. There is no evidence suggesting the community was involved in defining the problem or identifying the solution. No reflexivity or structural changes are noted.	The intervention only targeted individual behaviour although within a group context. The study did not consider larger systems or environments. Limited systems thinking is evidenced.	Members of an Aboriginal community organisations were consulted although there is not any direct efforts at knowledge translation. The focus of the intervention was on individual behaviour with limited engagement with end users.
Simmons et al. 2008	The engagement aspects included a Māori Steering Group and Māori community health workers. There was not much consultation with the community on the design and implementation of the intervention. CHWs were employed to	The community had limited input into defining the problem or solution. The intervention was provided to the CHWs. CHWs helped to adapt research processes to better fit cultural values of the community. CHWs served as personal	CHWs had social networks that gave them a unique ability to interact with the participants. The CHWs enhanced the experience for the participant based on their knowledge of the programme and the system. The implementation team did	The research team worked with Māori providers and other end users within the health system to implement the project. However, they were not partners in the project and there is no direct evidence of knowledge translation efforts.

Table 2 Study Synthesis using the He Pikinga Wairoa Elements *(Continued)*

Study	Community engagement	Cultural centeredness	Systems thinking	Integrated knowledge translation
	deliver the intervention though they had no input into the content. The CHWs helped improve the implementation of the intervention.	trainers to participants. There was reflexivity post study although limited evidence during the implementation process.	not realise the complex systems elements that shaped CHW work or the social networks of the community that affected implementation of the project (i.e., research model did not fit service expectations of the community).	
Sinclair et al. 2013	The study was part of an existing CBPR partnership called the PILI 'Ohana Project. A steering committee assisted in the planning and implementation of this study. Focus groups provided community engagement/perspectives for the design with peer educators used for implementation. Shared decision making and communication reflected throughout the research phases.	The curriculum for this study was adapted for the community using input from the steering committee and community focus group; this ensured the curriculum had culturally relevant knowledge and activities. Peer educators and steering committee members also contributed local and cultural knowledge by reviewing written materials and making suggestions for activities. Reflexivity evidenced through an ongoing partnership.	The partnership involved multiple aspects of the Native Hawaiian health system. Only individual level of analysis for the intervention. Key relationships were built in the community with the project leaders and the local community organisations.	The partnership includes relationship with the Native health system, community health centres, and grassroots organisations. Thus end users were engaged throughout the process. The level of knowledge translation beyond study period is not clear.
Tomayko et al. 2016	Project used CPBR throughout the research process. Community members and tribal leaders were integrated throughout the design and planning of the intervention. Members from health, education, child welfare, and tribal government bodies of the three initial participating communities met with researchers at a collaboration meeting to discuss results from a previous study with the community and possible interventions.	On-going research with the community assisted in building relationships and trust within the communities and study idea came from this previous research so reflects community voice in problem definition and solution. Community organisations were able to adapt the intervention to their communities. All materials and research processes were culturally appropriate (e.g., no control group, but rather having an alternative intervention group and having home mentors be community members).	The intervention focussed on family-level positing the best way to change individual behaviour was to incorporate the family. Other aspects of the community were not directly considered. Home mentors were used to facilitate programme delivery. Other systems thinking aspects were not addressed.	The intervention was developed with key end users including wellness staff and tribal leaders. They offered input to the intervention and the fact that all participants needed to have an intervention. Continued efforts by community to continue obesity prevention efforts included obtaining additional funding.
Qualitative Studies				
English et al. 2008	A CBPR process was used throughout the intervention. Tribal community, academic institution, and intertribal organisations joined together to share information and resources to collectively design a community-based intervention. Many preliminary activities were conducted to build relationships with the community.	The preliminary activities allowed the project team to gain a better understanding of the issues among the community. Education courses were held to advance community empowerment. Focus groups were held for participants to discuss the barriers to receiving health care. Community voice was evidenced through and the partnership used reflexive dialogue. Resources were brought to community members to facilitate screening.	The projected was guided by the socioecological framework. Systems networking allowed structural changes to happen within bigger organisations. Hospital staff agreed to setting specific days aside for the participants which encouraged their participation in the project. Community health workers were members of the community themselves and worked to inform participants and recruit for the project.	Tribal leaders and community organisations were included in the participatory process. Efforts sought to develop policy change. Authors concluded that the intervention was sustained by the community.
Sushames et al. 2017	There is no clear initial consultation with the participants before the intervention was designed and implemented. It was noted there was a participatory process	The intervention included interviews although they were only conducted post intervention. They were also conducted by a non-Indigenous researcher, who had	The study focused on enablers and barriers to participation which included elements at various levels in the system. These helped illustrate the larger community	There was limited engagement with end users with only a local organisation consulted primarily for recruiting participants. It was noted that this intervention did not have

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Table 2 Study Synthesis using the He Pikinga Wairoa Elements *(Continued)*

Study	Community engagement	Cultural centeredness	Systems thinking	Integrated knowledge translation
	with support by local Indigenous mentors and a local Aboriginal health organisation. Despite this notation, there is no clear indication of shared decision making or partnership between the researchers and the community.	previous established relationships with the participants. The analysis was conducted by the research team. No clear evidence of its processes in designing the intervention and inclusion of community voice beyond the use of local Indigenous mentors. The mentors helped provide insights on cultural ideologies.	systems and relationships among people and cultural constructs. The study helped to illustrate why the intervention was not well attended despite having positive impacts.	sustainable outcomes for the communities.
Townsend et al. 2015	The study was part of an existing CBPR partnership called the PILI 'Ohana Project. An existing steering committee assisted in the planning and implementation of this study. This study involved genetic testing and engagement with the steering committee was paramount for the implementation of the study.	Biospecimens were required for this study which caused some concern for the community. The steering committee met several times to determine an appropriate process. The intervention had semi-structured support groups to address any new or pending concerns from the participants. They also held an informal meeting for community participants for reassurance. Thus, there was good community voice for approval of the project. Reflexivity is evidence by ongoing dialogue about the project.	The project acknowledged the larger history about genetic testing in Indigenous communities and sought ways to address these issues. A follow-up was conducted in a community setting and the committee took on board the feedback from the participants to create a newsletter presenting the general findings. Focus groups were also held with eight participants to discuss their thoughts on the intervention. These enabled feedback loops to be included.	End users from the community organisation where the study took place was engaged in the process. This engagement and trust building allowed the study to happen. Further data collection/genetic testing is thus an option.
Tumiel-Behalter et al. 2011	This study was held in four different communities (one Indigenous). Each community initially received the same core intervention although researchers and community partners quickly learnt that they needed to be adapted to each community. Researchers reached out to community organisations within the areas to identify a community partner to collaboratively adapt and implement the programme.	Community partners and participants were asked to provide feedback to the overall project team to improve the program. Various formats such as focus groups, conversational interviews and surveys were implemented throughout the process on an ongoing basis to continually improve the program. The feedback assisted not only the overall project, it also allowed the community partners to create the changes. Community voice was acknowledged in the adaption of the core programme.	Project staff sought to integrate the intervention into the local community infrastructure. Activities targeted individual and community change. There was acknowledgement of social determinants of health and key social issues (e.g., drugs, violence, and unemployment).	End users in each community were consulted with the goal to initiate the programme with funds, staff and resources, and to gradually transfer ownership and leadership to the community partner as the programme progressed. The input from the end users helped to make the programme sustainable in most of the communities, including the Indigenous community.

pattern. Each of these studies demonstrated clear understanding of multiple causes and perspectives and included systems-level activities. Most of these studies also had multi-level intervention activities as well. The second pattern was studies that focussed only on individual-level behaviour and demonstrated limited ST [44, 47, 54, 56, 57, 60, 64]. These studies did not integrate multiple perspectives and typically only included minimal feedback loops in adapting the intervention. Two of these studies provided retrospective recognition of ST as providing explanations for the challenges in implementing the intervention [60, 64]. The final pattern were studies that targeted individual-level behaviour although included ST in the design of the intervention. Four of these studies included multi-level activities in the intervention [53, 58, 59, 61], while the others integrated ST through partners and steering committees to help improve implementation effectiveness [45, 46, 51, 52, 62].

IKT includes three predominant approaches in the studies. First, nine studies had limited or no knowledge translation activities or engagement with end users [44, 45, 47, 55–58, 60, 64]. These studies may have consulted end users at the beginning of the study although that was primarily for the purpose of approving the study or gaining access to participants. One of these studies did actively engage with end users in knowledge translations at the end of the study although they did not appear to be integrated throughout the study [58]. Second, four studies included end users through a steering committee that included members of the health system [46, 51, 52, 62]. Thus, the end users were integrated into the design and implementation of the intervention; however, these studies did not directly discuss how knowledge translation activities occurred or whether the intervention was sustainable. Third, eight studies described the integration of community and organisational leaders throughout the design and implementation process and also discussed how the study led to continued activities or funding and/or structural or policy changes [48–50, 53, 54, 59, 61, 63]. These studies represent high levels of IKT.

Discussion
The purpose of this study was to systematically review the implementation of non-communicable disease health interventions into Indigenous communities and identify the degree to which HPW elements were reflected in these studies. The studies demonstrate a number of positive health outcomes at both individual and community levels and cover a range of non-communicable diseases. Two key patterns emerge about the implementation of these interventions: (a) high levels of CE and CCA—including the prominence of community health workers—and (b) comparatively lower levels of ST and IKT. Implications and limitations are noted.

Community engagement and culturally-centred approach
About two thirds of studies identified participatory approaches as being prominent in the design. These findings reflect the extant literature that argues for participatory approaches to developing and implementing health interventions with Indigenous communities [23, 65, 66]. Further, a variety of systematic and meta-analytic reviews have found positive associations between CE and health outcomes [21, 26, 67] with the most popular CE approach being CBPR. In addition, an international literature review found that CE has been linked to positive outcomes such as social capital and neighbourhood unity for socially excluded groups [21]. This is supported by an evaluation suggesting that interventions led by community organisations were more successful at engaging secluded groups than government initiatives [67].

Similarly, the CCA is consistent with CE as it emphasises community voice/agency for engaging in change around health [17]. Such an approach centres culture and cultural perspectives and thus is consistent with Indigenous autonomy and self-determination. Many Indigenous organisations have placed a priority on the development of an Indigenous health workforce that has both professional and cultural competence [68], drawing on the fact that culturally adapted health interventions are more effective than traditional "top-down" interventions [69]. Beyond the participatory approach, the CCA advocates for reflexivity of external partners and structural change to facilitate implementation effectiveness. These elements reflect the need for interventions to provide resources and systems change to improve health equity [17]. However, only slightly more than a third of the studies had evidence of research reflexivity or structural change within the studies.

A key way that many studies helped to support CE and/or the CCA was the use of CHW. The majority of studies in this review used CHW although they may have been called lay health advisers, peer educators, or lifestyle coaches. CHW are considered to be successful due to the relationship they have with the community; they are trusted members who are able to communicate effectively with community members because they are aware of cultural values and reflect the diversity of the population served (i.e., they have cultural knowledge) [70]. The prominence of CHW in these studies is consistent with the extant literature finding frequent use of CHW particularly in Indigenous and ethnic minority communities [71–73]. CHW involvement in interventions is associated with a variety of positive health outcomes including non-communicable diseases and benefits to health service utilisation [71, 74]. CHW are also generally part of an overall philosophy that reflects Indigenous knowledge and participatory approaches such as community engagement [75]. However, it is

important to note that some studies in this review that have lower CE and CCA still used CHW [47, 60]; hence, the presence of CHW does not mean an intervention automatically has high levels of CE and CCA.

Systems thinking and integrated knowledge translation

While the reviewed studies collectively had high levels of CE and CCA, there were fewer studies with high levels of ST and even fewer with a high level of IKT. For ST, only a small number of studies had multi-level perspectives and activities and focused on outcomes at a systems level. More studies included information reflecting systems perspectives and multi-level activities although focussed only on individual-level outcomes with a third of studies having limited ST. ST helps to identify a holistic perspective of health issues and also provides boundaries of the intervention within the system for effective implementation (e.g., recognising facilitators and barriers) [76]. Recent literature suggests that combining participatory approaches with ST is the key to improving health equity in communities [29]. Participatory approaches enable multiple stakeholders and perspectives consistent with ST; however, the current review included studies with strong participatory approaches without ST [54] and also strong ST without participatory approaches [55].

Slightly more than a third of the studies in this review demonstrated high levels of end-user engagement and thus IKT, while the other studies had limited or only some engagement with end users. IKT is an important factor for facilitating the translation of evidence-based interventions into policy and practice as it helps to navigate larger health systems and the perspectives of key stakeholders [33, 37, 77]. End users often have the power to shape policy and provide resources to sustain interventions; their integrated engagement provides an opportunity for researchers to understand the larger policy and practice context [33]. Co-design of research between Western researchers and Indigenous end users also facilitates effective knowledge translation between Western scientific and Indigenous knowledge systems [37].

Implications

This review utilised the HPW framework in a post hoc manner to identify patterns in the implementation of chronic condition health interventions in Indigenous communities. Several implications and some future research results from this review. The relatively high levels of CE and CCA are consistent with autonomy and self-determination in Indigenous communities. Autonomy has not been handed to the Indigenous communities, but rather it has been demanded by many Indigenous cultures as a rejection of policies of assimilation resulting from colonial histories [68]. Self-determination is a

key element for implementation and intervention effectiveness in Indigenous communities [15, 65]. Self-determination facilitates acceptability of interventions because it ensures a sense of ownership, cultural relevance and the centring of Indigenous knowledge to the health problem. Self-determination is often achieved through participatory approaches like CBPR because of the shared decision-making in the interventions [78].

Additionally, enhancing ST and IKT may enhance the sustainability of the health interventions. However, there is clearly a need for future research in this area. This review identified a lack of long-term or systems-level outcomes overall. Much of the focus in outcomes was on individual-level behaviour and knowledge changes. Sustainability was often only included in the discussion of the future implications for the research and not within the research project itself; there were certainly exceptions to this with some projects designed around creating an intervention sustainable beyond at least the study period, and these studies reflected high levels of ST and IKT [49, 50].

Very few of the reviewed studies demonstrated high levels of all of the HPW elements. What is not clear at this stage is whether a given intervention needs to be strong in each factor to address health equity. The extant literature demonstrates that each element has positive associations with some aspects of health; although it is not clear whether the collective elements are needed to make a significant improvement in health equity. The diversity of health outcomes, from individual knowledge to system-level change, make it difficult to directly compare the value-added for each individual element. Thus, the current state is that this review provides insights about likely avenues to improve implementation effectiveness for achieving gains towards health equity although does not provide direct evidence.

Finally, there are some interesting insights about the methodological appraisal and the study characteristics. Given that these were studies in the community, most of the studies lacked some of the key elements of traditional research design such as strict blinding in randomisation or even formal adherence to randomisation. Further, in all but two of the randomised trials included in the reviews [53, 60], the intervention was eventually delivered to the comparison group or an alternative intervention was provided. This approach is common in Indigenous communities as to withhold an intervention is not consistent with collective values and inclusiveness [66]. These approaches are ways to decolonise research methods to ensure the Indigenous knowledge and values are strongly reflected in the research [66]. This type of inclusivity and community benefit likely should be included in methodological appraisals of Indigenous community health interventions.

Limitations

This review is not without limitations. First, given the diversity of health issues, study outcomes and levels of analysis, it is not possible to link study outcomes to specific aspects of the HPW framework. Future research can better explore the concrete relationships between elements of the framework and specific health outcomes. Second, while we have attempted to be rigorous in our search strategy, it is possible that relevant studies have not been included, particularly those not formally published. Also, in the search terms, we opted to use "Native American" and not "American Indian;" hence, relevant studies may have been missed. Finally, we acknowledge that our findings and conclusions are based on the data each publication has provided even if they did not label the information as a particular HPW element. The lack of data regarding ST and IKT does not necessarily mean that they did not consider those elements as page limits may limit reporting of some information. However, we encourage researchers to report on all four HPW elements when describing the implementation of health interventions with Indigenous communities to enable knowledge consolidation about these topics and advance thinking about how best to apply these principles for improved implementation and maximum impact.

Conclusion

In conclusion, the He Pikinga Waiora Implementation Framework posits that participatory approaches such as CE and CCA, along with ST and IKT, are important to utilise when developing health interventions for Indigenous communities in order to achieve health improvement and health equity. This framework reinforces the idea that Indigenous communities will support health interventions that they help to create as it aligns with their cultural views, making the intervention more beneficial and sustainable for the community. The current review illustrates various patterns of each of the HPW elements with CE and CCA more prominent than ST and IKT. The review also illustrates that few studies incorporate all four elements of the HPW framework although future research is needed to determine the value added for each of the elements.

Additional files

Additional file 1: PRISMA checklist. (DOC 64 kb)

Additional file 2: Additional references. (DOCX 18 kb)

Additional file 3: Study characteristics. (DOCX 30 kb)

Abbreviations

CCA: Culture-centred approach; CE: Community engagement; CHW: Community health workers; HPW: He Pikinga Waiora (Enhancing Wellbeing) Implementation Framework; IKT: Integrated knowledge translation; PRISMA: Preferred Reporting Items for Systematic Reviews and Meta-Analyses; ST: Systems thinking; USA: United States of America

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Appendices

Appendix 1 – Additional File 1: PRISMA Checklist

Chapter 3 - Table 1: PRISMA 2009 Checklist

Section/topic	#	Checklist item	Reported on page #
TITLE			
Title	1	Identify the report as a systematic review, meta-analysis, or both.	1
ABSTRACT			
Structured summary	2	Provide a structured summary including, as applicable: background; objectives; data sources; study eligibility criteria, participants, and interventions; study appraisal and synthesis methods; results; limitations; conclusions and implications of key findings; systematic review registration number.	2-3
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of what is already known.	4-6
Objectives	4	Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICOS).	6-7
METHODS			
Protocol and registration	5	Indicate if a review protocol exists, if and where it can be accessed (e.g., Web address), and, if available, provide registration information including registration number.	3
Eligibility criteria	6	Specify study characteristics (e.g., PICOS, length of follow-up) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rationale.	7
Information sources	7	Describe all information sources (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and date last searched.	7
Search	8	Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.	7-8
Study selection	9	State the process for selecting studies (i.e., screening, eligibility, included in systematic review, and, if applicable, included in the meta-analysis).	8

Data collection process	10	Describe method of data extraction from reports (e.g., piloted forms, independently, in duplicate) and any processes for obtaining and confirming data from investigators.	8-9
Data items	11	List and define all variables for which data were sought (e.g., PICOS, funding sources) and any assumptions and simplifications made.	9
Risk of bias in individual studies	12	Describe methods used for assessing risk of bias of individual studies (including specification of whether this was done at the study or outcome level), and how this information is to be used in any data synthesis.	9
Summary measures	13	State the principal summary measures (e.g., risk ratio, difference in means).	9
Synthesis of results	14	Describe the methods of handling data and combining results of studies, if done, including measures of consistency (e.g., I^2) for each meta-analysis.	9

Section/topic	#	Checklist item	Reported on page #
Risk of bias across studies	15	Specify any assessment of risk of bias that may affect the cumulative evidence (e.g., publication bias, selective reporting within studies).	8
Additional analyses	16	Describe methods of additional analyses (e.g., sensitivity or subgroup analyses, meta-regression), if done, indicating which were pre-specified.	n/a
RESULTS			
Study selection	17	Give numbers of studies screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally with a flow diagram.	10; Figure 1
Study characteristics	18	For each study, present characteristics for which data were extracted (e.g., study size, PICOS, follow-up period) and provide the citations.	11; Additional file 4
Risk of bias within studies	19	Present data on risk of bias of each study and, if available, any outcome level assessment (see item 12).	10-11; Table 1
Results of individual studies	20	For all outcomes considered (benefits or harms), present, for each study: (a) simple summary data for each intervention group (b) effect estimates and confidence intervals, ideally with a forest plot.	11; Additional file 4
Synthesis of results	21	Present the main results of the review. If meta-analysis is done, include for each, confidence intervals and measures of consistency.	12-13, Table 2
Risk of bias across	22	Present results of any assessment of risk of bias across studies (see Item 15).	n/a

studies				
Additional analysis	23	Give results of additional analyses, if done (e.g., sensitivity or subgroup analyses, meta-regression [see Item 16]).		n/a
DISCUSSION				
Summary of evidence	24	Summarize the main findings including the strength of evidence for each main outcome; consider their relevance to key groups (e.g., healthcare providers, users, and policy makers).		13-14
Limitations	25	Discuss limitations at study and outcome level (e.g., risk of bias), and at review-level (e.g., incomplete retrieval of identified research, reporting bias).		17
Conclusions	26	Provide a general interpretation of the results in the context of other evidence, and implications for future research.		13-17
FUNDING				
Funding	27	Describe sources of funding for the systematic review and other support (e.g., supply of data); role of funders for the systematic review.		18

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Appendix 2 – Additional File 2: Additional References

References Consulted Related to Primary Study and Quality of Final Details on Intervention Development and Implementation Related to He Pikinga Waiora Elements

Chapter 3 - Table 2: Additional References

Primary Study	Additional References Consulted	Details (Good, Fair, Poor)
Observational Studies		
Benyshek et al. 2013	None	Fair
Christopher et al. 2008	Smith A, Christopher S, Knows His Gun McCormick A. Development and implementation of a culturally sensitive cervical health survey: A community-based participatory approach. Women Health. 2004; 40(2): 67-86.	Good
Coppell et al. 2009;	Tipene-Leach DC, Coppell KJ, Abel S, Pāhau HL, Ehau T, Mann JI. Ngāti and healthy: translating diabetes prevention evidence into community action. Ethn Health. 2013; 18:402-14.	Good
Kaholokula et al. 2014	Mau MK, Kaholokula JK, West M, et al. Translating diabetes prevention into Native Hawaiian and Pacific Islander communities: the PILI 'Ohana Pilot project. Prog Community Health Partnersh. 2010; 4: 7-16; Nacapoy AH, Kaholokula JK, West MR, et al. Partnerships to address obesity disparities in Hawai'i: the PILI 'Ohana Project. Hawaii Med J. 2008; 67(9): 237-41.	Good
Kakekagumick et al., 2013	Saksvig BI, Gittelsohn J, Harris SB, Hanley AJ, Valente TW, Zinman B.A pilot school-based healthy eating and physical activity intervention improves diet, food knowledge, and self-efficacy for native Canadian children. J Nutr. 2005; 135:2392–8.	Good
Reilly et al. 2011	Reilly R, Doyle J, Rowley K: Koori community-directed health promotion in the Goulburn Valley. Australian Community Psychologist. 2007; 19:39-46.	Good
Shah et al. 2015	Supplemental File: Study Protocol	Good
Randomised Control Trial		
Brimblecombe et al. 2017	Brimblecombe J, Ferguson M, Liberato SC, et al. Stores Healthy Options Project in Remote Indigenous Communities (SHOP@RIC): a protocol of a randomised trial promoting healthy food and beverage purchases through price discounts and in-store nutrition education. *BMC Public Health* 2013; 13: 744.	Good

Canuto et al 2012	Canuto K, McDermott RA, Cargo M, Esterman, AJ. Study protocol: a pragmatic randomised controlled trial of a 12-week physical activity and nutritional education program for overweight Aboriginal and Torres Strait Islander women. BMC Publ Health 2011, 11:655.	Good
Ho et al. 2008	Rosecrans A, Gittelsohn J, Ho LS, Harris SB, Ford E, Naqshbandi M, et al. Process evaluation of a multi-institutional community-based program for diabetes prevention among First Nations. Health Educat Res. 2008: 23: 272-86.	Good
Kaholokula et al. 2012	Mau MK, Kaholokula JK, West M, et al. Translating diabetes prevention into Native Hawaiian and Pacific Islander communities: the PILI 'Ohana Pilot project. Prog Community Health Partnersh. 2010; 4: 7-16; Nacapoy AH, Kaholokula JK, West MR, et al. Partnerships to address obesity disparities in Hawai'i: the PILI 'Ohana Project. Hawaii Med J. 2008; 67(9): 237-41.	Good
Karanja et al. 2010	Supplementary appendix	Fair
Kolahdooz et al. 2014	Sharma S. Assessing diet and lifestyle in the Canadian Arctic Inuit and Inuvialuit to inform a nutrition and physical activity intervention programme. J Hum Nutr Diet. 2010; 23:5–17; Sharma S, Gittelsohn J, Rosol R, Beck L. Addressing the public health burden caused by the nutrition transition through the Healthy Foods North nutrition and lifestyle intervention programme. J Hum Nutr Diet. 2010; 23:120–28	Good
Mendham et al. 2015	None	Fair
Simmons et al. 2008	Blundell R, Gibbons V, Lillis S. Cultural issues in research, a reflection. N Z Med J. 2010; 123(1309):97-105.	Good
Sinclair et al. 2013	Nacapoy AH, Kaholokula JK, West MR, et al. Partnerships to address obesity disparities in Hawai'i: the PILI 'Ohana Project. Hawaii Med J. 2008; 67(9): 237-41.	Good
Tomayko et al. 2016	Adams AK, LaRowe TL, Cronin KA et al. The Healthy Children, Strong Families intervention: design and community participation. J Prim Prev. 2012; 33: 175–85.	Good
Qualitative Studies		
English et al. 2008	None	Good
Sushames et al. 2017	None	Fair
Townsend et al. 2015	Nacapoy AH, Kaholokula JK, West MR, et al. Partnerships to address obesity disparities in Hawai'i: the PILI 'Ohana Project. Hawaii Med J. 2008; 67(9): 237-241.	Good

Tumiel-Behalter et al. 2011	None	Good

Appendix 3 – Additional File 2. Data Extraction Tool

Reviewer   _____

Date   _____

Article Citation   _____

<u>Study Description</u>

Methodology

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Methods

_____

_____

Indigenous Group/Participants

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Measures

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Data Analysis

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Results

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<u>Intervention Development</u>

Health Issue

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Who delivered it

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Community engagement

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Culture centredness

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Systems Thinking

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Integrated Knowledge Translation

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Appendix 4 – Additional File 3: Study Characteristics

Chapter 3 - Table 3: Study Characteristics

Study	Participants	Intervention	Methods	Study Findings	≥1 Primary Effect	50% of Effects
Observational Studies						
Benyshek et al. 2013	22 American Indian/Alaska Natives living in Las Vegas, Nevada, USA	16-week type-2 diabetes prevention curriculum with weight-loss curriculum, meal planning, fat gram and calorie counting, portion size, and food content; delivered by lay lifestyle coaches	Pilot, single group pre- and post-study design; Baseline and post-participation survey along with clinical measures using standardized protocols;12 completers (55%), 3 partial completers (no clinical measures), 7 non-completers (only baseline)—used intention-to-treat analysis; inclusion/exclusion criteria of Body-Mass Index (BMI) ≥25 and HbA1c (between 5.4% and 6.4%; 36-46 mmol/mol) with no major illness or using medication that would interfere with glucose tolerance; no random selection	Weight loss (-5.79%, p=.01); BMI (-5.9%, p=.01; Waist circumference (-4.34% reduction, p=.01); Triglycerides (-15.89% reduction, p=.71); HDL cholesterol (+12.92%, p =.007), Fasting blood glucose (-.39%, p=.50); Systolic BP (-6.04%, p=.34), Diastolic BP (-1.95%, HbA1C (no change); Qualitative results identified 8 themes related to program experience	Y	N
Christopher et al. 2008	101 women in the Apsáalooke community, Montana, USA	Cervical cancer education and general health education delivered by lay health advisors (Messengers for Health)	Single group pre-test/post-test design; three-year follow-up; 83 completers of both tests (82%); Used scales adapted from other surveys to measure pap test knowledge, cervical cancer knowledge, comfort discussing cancer issues, and awareness—internal consistency was assessed no validity information provided; Random selection of participants	Pap test knowledge (-.11, p=ns); Cervical cancer knowledge (+.29, p<.05); Comfort (+.42, p<.05); Awareness of cervical cancer-2 questions (.16, p< .01; .24, p<.001, .70); Qualitative results found support for using of community-based participatory research (CBPR) approach; the program was widely accepted	Y	Y
Coppell et al. 2009	286 at baseline and 235 at	Community-led diabetes prevention program (Ngati	Interrupted time-series prevalence surveys; Two-year time difference	Selected findings: Insulin resistance (-10.1%, p=.0003);	Y	N

	follow-up in a predominantly Māori community from the East Coast (Gisborne), New Zealand	and Healthy) aimed at the entire community; Involved local health promotion programs, community education program for high-risk individuals, and a structural strategy. Used community health workers	between two separate randomly selected samples; Exclusion criteria were terminal illness, death or migration form study area; Used clinical and validated self-reported measures	Among 25-49 women: 5+ times/week exercise (+15.16%, p=.04); Wholemeal bread (+20.3%, p=.0002); Among 25-49 men (-.15mmol/l HDL cholesterol, p=.038)		
Kaholokula et al. 2014	239 Native Hawaiian and Pacific Islander adults in Hawaii, USA	Three-month (16 lessons) adapted diabetes prevention program; Delivered by community health advocates; Adapted CBPR	Single group pre-test/post-test design with four different community groups receiving same intervention; Inclusion criteria was 18 years of age or older, ethnicity, BMI ≥ 25 (≥ 23 for Filipinos), have a family member or friend to participate; Measures included clinical (anthropometric), behavioural, and demographic as confounders; Measures were reliable and valid	Weight (-1.7 kg, p <.001); BMI (-0.6, p<.001), Systolic BP (-3.3, p<.01), Diastolic BP (-3.4, p<.001), 6-minute walk test (+106.6 ft walked, p<.001), Physical activity frequency (+0.5, p<.01), Fat in diet (-0.3, p<.001); Comparisons of the four groups showed differences in outcomes with Native Hawaiians fairing better than immigrant Pacific Islanders	Y	Y
Kakekagumick et al., 2013	Members of the Sandy Lake First Nations community, Canada including 47 students	Sandy Lake Health and Diabetes project to address type-2 diabetes and including multiple elements over a 20 year period: community survey, food store program, home visit program, diabetes road show, and school-based curriculum; Delivered by various community workers	Study reports results from school-based curriculum that included a pre-test/post-test design with four data collection points over 8-month period; Measures included self-report student questionnaire, 24 hour diet recall, anthropometric data, and physical activity test; 80% retention rates over four time periods; Details about participants are missing	Self-efficacy increased from initial to final (=0.4, p<.001) along with health and dietary knowledge (+0.21, p<.001); Time watching TV decreased (-62 minutes/week, p<.05); BMI increased (+2.7, p<.0001)	Y	N
Reilly et al. 2011	1800 Aboriginal people in three community	Health promotion program implemented by local health workers; Included health summer school for	Ecological analysis of the health program using a scoring framework; Included store turnover of the football/netball club; Questions adapted	Food store turnover: Increase in fresh meat, eggs, fruit, vegetables and bread/flour with decreases in cakes, confectionary and pies;	Y	Unknown (total number of

	organisations of northern Victoria, Australia	practitioners, nutrition program for under 17-footballers; initiatives aimed at improving dietary quality at a football/netball club; focus groups for adapting nutritional guidelines; weekly self-directed meeting for women; and workplace exercise program	from prior studies to evaluate each of the activities (validity and reliability of measures unclear); Outcomes were at organisational level; One year follow-up although results presented only at a descriptive level	Ecological analysis: 10 different activities targeted organisations and individuals although no specific outcomes provided		effects not clear)
Shah et al. 2015	60 Zuni (American Indians) with type-2 diabetes in New Mexico, USA	Home based intervention delivered by community health representatives to improve self-managed care; Included one hour didactic and then monthly educational classes of 7-10 individuals	Single group pre-test/post-test design; Measures included physical exam, point of care testing, educational intervention survey and the patient activation measure; Six- month follow-up; Inclusion criteria included HbA1C > 6.5%; No drop-outs	Patient activation increased by one level in 58% of patients, 40% did not change and 2% declined one level; HbA1C (-.73, p=.001), fasting blood glucose (-23.8 mg/dl, p=.0003), BMI (-1.4, p=.001) total cholesterol (-11.5 mg/dl, p=.003), triglycerides (-38 mg/dl, p=.001)	Y	Y
			Randomised Control Trial			
Brimblecombe et al. 2017	20 communities in remote Indigenous communities, Northern Territory, Australia	20% price discounts on food and drink purchases with and without consumer education to determine impacts on fruit and vegetables purchased; Consumer education included monthly messages for six months; Collaborated with retail store associations and community leaders	Stepped-wedge randomised trial with randomisation at the community level and stratified by store association to receive consumer education (n=10) or not (n=10); Inclusion criteria was community with at least 100 people, very remote and socioeconomic disadvantaged and community store managed by one of two associations with no other store within 20km; Weekly store sales data in 20 stores were collected 49 weeks baseline; 24 week intervention phase and 24 week post intervention on fruit and vegetables, drinks and other foods; Sensitivity	Price discount was associated with a 12.7% (p<.001) increase in purchases in grams of fruit and vegetables during the intervention and a 19.8% (p< .001) increase post-discount; Consumer education had no significant impact on combined fruit and vegetable purchases or on most purchases--it did have an impact on vegetable purchases only during the discount (+13.6%, p =.014) and not after (+9.1%, p =.055).	Y	N

			analysis was conducted by removing one store at a time in the analysis			
	Canuto et al. 2013	100 Aboriginal and Torres Strait women aged 18-64 in Adelaide, Australia	12-week exercise and nutrition program including two 60-minute group exercise classes/week with a fitness instructor and four nutrition workshops with dietician overall; Constructed with consultation from two community organisations and advisory group	Participants were randomly assigned to an active or waitlisted (comparison group); Inclusion criteria: waist circumference > 80; Exclusion criteria were pregnancy and physically unable to participate; Measures included anthropometrics and clinical measures such as HbA1C, lipid profile, blood pressure prior to the program, immediately after the program and then with additional 3-month follow-up; 59% retention rate; Analysis controlled for baseline demographics and lost to follow-up included	Active group, compared to waitlisted group, had significant reductions in weight (1.65 T2 and 2.5 T3) and BMI (.66 T2 and 1.03 T3); Waist circumference and clinical measures were not significantly changed	Y
100	Ho et al. 2008	133 First Nations people in Ontario, Canada	6-8 week school, store and community intervention for prevention of diabetes risk factors (Zhiiwapenewin Akino'maagewin: Teaching to Prevent Diabetes); Improve food options at stores; Community events and health promotion; Delivered by a trained program assistant who was a community member	Quasi-experimental pre-test/post-test design; Intervention group at the community level; 2 matched intervention and 2 matched control groups; Exclusion criteria included pregnancy, recent birth or not living in community for 30 days; 9 month follow-up period with 71% retention; Measures include self-reports of food knowledge and healthy food behaviours with mixed reliability quality; Anthropometric measures assessed with standard equipment; Confounding measures included gender, age, and socio-economic status	Food knowledge (β=.10, p=.02) and health food acquisition (β=.95, p=.003) higher for intervention group; No difference in BMI (β=.82, p=.11) and body fat % (β=.15, p=.89); No difference in physical activity	Y
	Kaholokula et al. 2012	144 Pacific Islanders who had completed	PILI Lifestyle Program (PLP), a six-month weight loss maintenance	Pilot randomized control trial with the program compared to a standard program; Eligibility was completion of	PLP participants were 2.5 times more likely to maintain weight loss compared to standard program	Y

Note: The final column values (N, N, Y) for the three rows respectively appear in the rightmost column.

	a three-month weight loss program (50% Native Hawaiian), USA	intervention; Monthly sessions; Delivered by trained peer educators; Developed through CBPR process	the initial weight-loss program, BMI > 25, willingness to participate and include at least one family member; Compared people who did not advance to maintenance program and found no difference than those who participated; six-month follow-up with 70% retention; Loss to follow-up included in intention to treat	(p=.09); Those who completed at least half the sessions were 5.1 times more likely to maintain weight loss (p=.02)		
Karanja et al. 2010	205 American Indian families from three tribes in the Portland Area Indian Health service, USA	Community-wide intervention plus a family component to promote breastfeeding and reduce the consumption of sugar-sweetened beverages; final goal of reducing BMI-Z scores in children 18-24 months of age; Family component included 7-21 home visits completed by community health workers; Community component include awareness and health education	Three tribes randomly assigned to two active interventions (community intervention; community plus family) in a pre-test/post-test design; No active control group—used pre-test sample of children born two year earlier in the same tribes; Inclusion criteria were family with expectant mother from one of three tribes; 24-month follow-up with 86% completion rate; Measures included chart review of breastfeeding, self-report for confidence and calibrated scales and stadiometers for BMI	Breasting feeding initiation and 6-month duration increased 14 and 15% over national rates; BMI-Z scores decreased in the community plus family intervention compared to community intervention only (-0.75, p = .02)	Y	Y
Kolahdooz et al. 2014	332 Inuit and Inuvialuit adults living in Artic Canada	12-month Healthy Foods North intervention program to improve diet; Program including health promotion and educational activities in media, grocery stores, health clinics and community events	Quasi-experimental, pre-test/post-test design of randomly selected participants; Four communities received the intervention and then two control communities received it later; Exclusion criteria were pregnant and lactating women and < 19 year of age; Validated food frequency and adult impact questionnaires along with anthropometric measures were used;	For intervention compared to control, decrease in high fat meats (-27.9g, p<.05) and high fat dairy (-19.8g, p<.05) and increase in healthier preparation methods (0.5, p<.001)	Y	N

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			One-year follow-up period Retention rates of at least 83%			
Mendham et al. 2015	33 inactive Indigenous Australian men, New South Wales	12-week sports based exercise intervention for markers associated with type-2 diabetes; Weekly training for 2-3 days in a group environment; Supervised by a fitness instructor	Pilot randomized control trial with exercise (n=16) and control (n=10) groups in a pre-test/post-test design; Exclusion criteria was a diabetes diagnosis; Measures included glucose regulation, anthropometrics, and inflammatory markers and peak aerobic capacity; 64% retention rate with three-month follow-up; Lost to follow-up not included in final analysis	Exercise condition decreased insulin resistance, insulin area under the curve, BMI, waist circumference, waist to hip ratio and increased estimated insulin sensitivity and peak oxygen consumption compared to control group (p<.05)	Y	N
Simmons et al. 2008	160 Māori without diabetes in New Zealand	Personal trainer who was a Māori community health worker to help prevent progression of impaired glucose tolerance to type 2 diabetes; Workers followed structured interview approach with patients received baseline results for tailored advice on weight loss	Pilot randomized control with pre-test and post-test design (part of larger cluster-control trial); Participants compared to 52 weighed immediately before intervention and 1143 people from the same geographical area; Measures included clinical and anthropometric although only weight presented in this study; Approximately 12-month follow-up (not directly reported) and retention rates of 66%; those lost to follow-up not discussed or included in analysis	Most participants (n=106) had significant weight loss from first to last visit; those with IGT (n=27) experienced significant weight loss at final visit (5.2 kg, p<.01); No significant difference between treatment and control group at first visit (only direct comparison made)	Y	N
Sinclair et al. 2013	82 Native Hawaiian and Pacific Islanders with diabetes, USA	Culturally adapted diabetes self-management program (Partners in Care, PIC); Used CBPR methods to adapt the program; Community peer educators helped adapt the program, recruited participants and delivered the program	Pilot test randomised control with pre-test and post-test evaluation (n=48 treatment and n=34 control); 3-month follow-up with 71% retention for treatment and 91% for control; Inclusion criteria of ethnicity, 18 years or older, had type-2 diabetes, and HbA1c≥7; Measures of HbA1C and self-report of understanding self-management, self-	Significant difference from intention to treat in HbA1C (-1.1, p<.0001), understanding (+13.1, p<.0001), and performing self-management (+4.9, p<.0001)	Y	Y

			care activities, and distress; Used intent to treat and completed case analysis			
Tomayko et al. 2016	150 adult/child (2-5 years old) dyads from families in four American Indian communities in Wisconsin, USA	Family-based toolkit to address obesity; 12 lessons delivered via community-based home mentor or monthly mailings; Home mentor a member of the community; Developed through a CBPR approach	Randomly assigned families to one of two treatment arms (home-based mentor or mailings) with pre-test/post-test design (eight families shifted to mailing arms after randomisation in alignment with CBPR principles); Inclusion criteria were families with child aged 2-5 years old without major behavioural or physical problems; Clinic sample was used as a comparison group; Primary measures included child and adult BMI and secondary measures included fruit/vegetable consumption, sugar consumption, television viewing, physical activity, self-efficacy and perceived health status; Two-year follow-up with 65% overall retention rate; Multiple imputation used for data from lost to follow-up	No significant effect of the treatment arms; Both arms showed improvements in the following: child BMI percentile ($p<.05$), child fruit/vegetable consumption ($p<.05$), child television viewing ($p=.05$), adult television viewing ($p=.002$), adult self-efficacy ($p=.006$) and quality of life ($p=.02$); No change found for adult BMI	Y	N

Qualitative Studies

English et al. 2008	39 women 50 years and older of the Ramah Band of Navajo Indians, New Mexico, USA	A program of individual, community and environmental elements to increase mammography rates (Ramah Navajo Mammography Days); Community health representatives participated in multiple aspects	Used CBPR principles to co-design the program; Conducted focus groups to identify key factors for early breast cancer detection; Included a short- self-report survey questionnaire about mammograms and attitudes post the events; Thick description of the phases of research provided	Focus groups identified knowledge, attitudes and beliefs that were used in the design of the intervention; 36% of the women received their first mammogram ever; 82% hadn't had a mammogram in at least five years prior to participating; 100% indicated a desire to participate again and would recommend to family and friends.	Y	Unknown (total number of effects not clear)

Sushames et al. 2017	34 Aboriginal or Torres Straight Islanders in a rural or regional community in North Queensland Australia	Eight-week physical activity program that aimed to improve health outcomes; Delivered by an sport scientist; Intervention was developed using CBPR	Inclusion criteria for the program were ethnicity, aged 18-45 and having a chronic disease or risk of chronic disease; Study used semi-structured interviews to explore the enablers and barriers to participation as the program has low attendance rates; Interview framework loosely guided by Health Belief Model; Interviews conducted by non-Indigenous researcher	Positive attitudes and high levels of motivations; Enablers were participation of family members, no financial cost and a good relationship with the principal investigator; Barriers included work commitments, travel away from community and lack of infrastructure	Unknown	Unknown(no direct outcomes stated)
Townsend et al. 2016	65 Native Hawaiians with type-2 diabetes, USA	Three-month diabetes self-management program developed through CBPR approach; Delivered by community health workers	Research process was developed through CBPR processes to explore issues of trust; Subset of 16 provided peripheral blood mononuclear cells to investigate molecular mechanisms; A focus group with this subset explored trust issues; Direct quotes from participants not provided	Biospecimen collection in Indigenous communities requires trust of the researchers; CBPR is a key approach for building trust and providing communities voice and protections; Preliminary results indicate changes in DNA that show why the intervention improved HbA1C	Y	N/A (total number of effects not clear)
Tumiel-Behalter et al. 2011	Nearly 3,500 participants in western New York, USA including 563 from the Seneca Nation of Indians	Community program to improve health of four underserved communities (Good for the Neighborhood); Core program includes health screenings, risk assessments, health education and exposure to health services; Delivered by staff of an independent community agency	The purpose was to describe the participatory approach used to develop the intervention; Multi-methods included key informant interviews, focus groups and surveys; Direct quotes from participants not provided	Programs has been sustained for three years and has reached 3,500 participants with 1/3 engaging regularly; Program adapted to focus on educational program, fitness classes, and nutrition classes on the Seneca community	N/A	N/A (total number of effects not clear)

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Chapter 4: Perceptions of co-designing health promotion interventions with Indigenous communities in New Zealand

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OXFORD

Perceptions of co-designing health promotion interventions with Indigenous communities in New Zealand

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Summary

Health inequities among Indigenous and non-Indigenous communities are well documented and the research literature includes robust discussions about innovative ways to reduce inequities including co-design. Co-designing health promotion interventions with Indigenous communities presents many benefits and challenges for researchers, health professionals and communities involved in the process. The purpose of this study was to identify the facilitators and barriers of co-designing a health promotion intervention with Māori communities. Additionally, this study considers a specific Māori co-design framework, He Pikinga Waiora (HPW). HPW is a participatory approach to creating interventions emphasizing community engagement, systems thinking and centred on Kaupapa Māori (an approach grounded in Māori worldviews). The research design for this study was Kaupapa Māori. Participants ($n = 19$) in this study were stakeholders in the New Zealand health sector. Participants were interviewed using an in-depth, semi-structured protocol. Thematic analysis was employed to analyse the data. Facilitators for co-designing health promotion interventions with Māori communities were collaboration and community voice. Barriers identified were mismanaged expectations and research constraints. Finally, facilitators for the HPW framework included providing clear guidelines and being grounded in Māori perspectives, while barriers included limited concrete case studies, jargon and questions about sustainability. Collaboration and inclusion of community voice supports the development of more effective co-design health promotion interventions within Māori communities which may address health inequities. The HPW framework offers clear guidelines and Māori perspectives which may assist in the development of effective co-design health promotion interventions, although areas for improvement were suggested.

Key words: co-design, community-based participatory research, health promotion interventions, He Pikinga Waiora Implementation Framework, indigenous

INTRODUCTION

Despite ongoing investment into evidence-based health promotion interventions to reduce health inequities (Cooksey, 2006), substantial differences in health conditions continue to exist between Indigenous and non-Indigenous communities (Anderson *et al.*, 2016). To address inequities, many Indigenous groups advocate for the inclusion of Indigenous health perspectives, values and traditions in the health system along with having power and autonomy to determine how health promotion interventions are implemented (Durie, 2004b). Such advocacy is consistent with health promotion goals to understand the diverse factors that influence individual and community health behaviours (e.g. cultural values and traditions, language, beliefs and key relationships) and utilizing them effectively to design, implement and translate health promotion interventions (DiClemente *et al.*, 2009).

In New Zealand, there is a sustained interest to reduce the health inequities between Māori (Indigenous people) and non-Māori. From as early as 2000, the health sector has openly acknowledged the cultural traditions of Māori as a key element of health promotion (King, 2000). Furthermore, successive governments have increased their efforts to evaluate communication strategies regarding health promotion to reduce health inequities for Māori (Bramley *et al.*, 2005). These efforts are acknowledged and yet there are still inequities that need to be addressed (Ministry of Health, 2013). Co-design is an oft-advocated approach to enable Māori partners to (co-)lead the conceptualization, design, implementation and interpretation of research outcomes related to health promotion interventions (Durie, 2004b).

Co-design approaches have a developing evidence base for producing positive health outcomes and reductions in health inequities, particularly in ethnic minority and vulnerable communities (O'Mara-Eves *et al.*, 2015; Ortiz *et al.*, 2020). Co-design includes the perspectives of the community members, practitioners and other stakeholders to work collaboratively to create, implement and evaluate projects (Boyd *et al.*, 2012). Co-design is a broad classification that has variants such as participatory health research (Wright, 2006), community-based participatory research (Wallerstein *et al.*, 2018) and tribal participatory research (Fisher and Ball, 2003). Co-design is a common label in New Zealand to describe this type of research (Boyd *et al.*, 2012). More specifically for Māori, Kaupapa Māori methodology challenges the dominance of the privileged Western worldview, and has a collective approach to benefit all the research participants and their collective

goals within a Māori setting (Smith, 1997). Kaupapa Māori is an approach that centres mātauranga (Māori knowledge) and tikanga (cultural protocols) in all aspects of the research process. It is generally seen as a 'by Māori for Māori' that emphasizes action-oriented approaches that provide community benefit (Smith, 1997).

While co-design has strong advocates in New Zealand and frequent use by Kaupapa Māori researchers and health professionals (Te Morenga *et al.*, 2018), it has not gained widespread use in the wider health system (Oetzel *et al.*, 2017); however, there is growing interest in it as an approach to address health inequities (Wallerstein *et al.*, 2018). There are also challenges in doing co-design well; e.g. the length of time to create a health promotion intervention (Wallerstein *et al.*, 2018). Furthermore, there is a gap in research exploring the facilitators and barriers of co-designing health promotion interventions with Māori communities.

In addition to exploring the perceived facilitators and barriers of co-design with Māori communities, this study examines a recently developed framework for co-design that is grounded in Kaupapa Māori methodology. The He Pikinga Waiora (HPW) (enhancing wellbeing) Implementation Framework (Oetzel *et al.*, 2017) is a theoretical framework outlining key principles for developing and implementing health promotion interventions with Indigenous communities. HPW centres Kaupapa Māori and integrates four key elements from the international literature: culture-centred approach (CCA), community engagement (CE), systems thinking (ST) and integrated knowledge translation (IKT). These four elements are reflective of Kaupapa Māori research as they address the imbalance of power, reaffirm the importance of Māori knowledge and customs and advocate for greater community participation (Smith, 1997).

The CCA provides opportunities for the 'voice' of disenfranchised communities, and recognizes the ways that structures contribute to produce health inequities (Dutta, 2007). The CCA is achieved in part by ensuring the community members are empowered to define health promotion problems and solutions alongside health professionals and researchers through a mutually respectful process. Such respect is supported through a process of reflexivity identifying issues of privilege to share power in the health promotion process. The CCA empowers Māori self-determination, challenges power imbalances and transforms the health promotion processes by encouraging greater community voice at all levels (Mane, 2009).

CE is the process of working with communities during health promotion and is seen to range on a continuum from organization led to shared leadership and

community-driven promotion (Yuen *et al.*, 2015). High levels of CE are reflected through shared decision-making and communication among researchers and community members which helps with sustainability, capacity building and long-term health outcomes (Wallerstein *et al.*, 2018). High levels of CE are strongly supported by Indigenous scholars (Tipene-Leach *et al.*, 2013).

ST helps to address the complexity of the local contexts, the variety of levels and the determinants of health problems (Frerichs *et al.*, 2016). It allows for new ways of thinking for researchers, practitioners and community members through considering different perspectives and relationships between people and various facets of the health system (Frerichs *et al.*, 2016). ST also acknowledges holistic perspectives towards health and examines the inter-relationships of the various parts that need to be understood within a larger context (Smith, 1997). The use of ST in this framework can improve the transition from theory to practice of health promotion by understanding these various relationships in the health system (Wilkinson *et al.*, 2018).

IKT emphasizes co-design and co-production with end users in developing and implementing an intervention for the purpose of transferring knowledge and enhancing sustainability (Grimshaw *et al.*, 2012). End users are the people who will use research findings and facilitate the translation from research to practice such as clinicians, policy makers, tribal leaders and systems administrators (Lavis, 2006). IKT involves the researchers and end users working in partnership to ensure there is shared ownership, and that any barriers to implementation and translation can be addressed early in the design process (Grimshaw *et al.*, 2012). For Indigenous communities especially, IKT also needs to ensure that the community benefits from the health promotion intervention, and that it is reflective of the community's traditions and knowledge (Durie, 2004a).

Thus, this study aims to explore the perspectives of health professionals and researchers in New Zealand about facilitators and barriers of co-design with Māori communities. This study also examines the advantages and disadvantages of the HPW framework when co-designing a health promotion intervention. Health professionals (e.g. allied health workers, community health workers, clinicians, health managers) and researchers are key to the development and implementation of health promotion interventions for addressing inequities (Bramley *et al.*, 2005). These professionals have experience with the health system and thus their perspectives about co-design are important for addressing inequities. We address three specific research questions to achieve these aims:

(RQ1) What are the facilitators of co-designing a health promotion intervention with Maori communities?

(RQ2) What are the barriers of co-designing a health promotion intervention with Maori communities?

(RQ3) What are the advantages and disadvantages of the HPW framework for implementing a health promotion intervention with Maori communities?

METHODS

The research design for this study was framed by Kaupapa Māori. The research processes were guided by a Māori worldview with the aim of providing beneficial outcomes for Māori communities. Open-ended interviews were used from an interpretive perspective to emphasize participant voices.

Participants and setting

The sampling criteria for participants in this study were stakeholders who were researchers or health professionals who have interest or influence related to health improvement for Māori communities. Inclusion criteria was experience in providing or researching health promotion interventions with Māori communities. Previous engagement with the HPW framework was not included in the criteria for the first nine interviews. However, the 10 participants in the follow-up interviews did have previous engagement with the framework. Recruitment was through snowball sampling as it uses interpersonal relationships and connections between people to reach out to other people who may have been overlooked (Goodman, 1961) and is consistent with Kaupapa Māori. Contact was made with the initial participants via email; those who responded and were interviewed then also provided connections to others who could be considered for the study.

Nineteen people were interviewed for this project. The demographic characteristics include: (i) 15 female and 4 male; (ii) 12 Māori and 7 non-Māori; (iii) 9 researchers, 4 CEOs/general managers of Māori Health organizations, 3 clinicians from Māori Health organizations, 2 community health workers and 1 manager of a general health organization. Participants came from various communities across the North Island with one from the South Island. Researchers are included in this study because they work in multiple health contexts and various points in the system whereas health professionals often work in a single context.

Data collection

Semi-structured interviews were employed for this study as they explore the perceptions and opinions of participants regarding complex issues (Barriball and While, 1994). This approach best suited this study as it focused on drawing out participant's knowledge and experiences with co-design and the HPW framework. Interviews were conducted face-to-face, over the phone and online video. Ten of the interviews conducted were over the phone, or online, to accommodate the schedules of the participants. Interviews conducted in these spaces are more convenient and flexible, and the ethical issues and processes are similar to interviews conducted face to face (Janghorban *et al.*, 2014). Interviews were recorded by the interviewers and transcribed by two reputable audio transcribing services. Each participant signed an informed consent form acknowledging that they agreed to the terms of the research. The study was approved by Waikato Management School at the University of Waikato which includes general and culturally specific research ethics protocols (WMS 15/202).

The data collection occurred in two stages. The nine initial interviews explored the facilitators and barriers of developing a Māori implementation science platform and were conducted by one of the co-authors. This interview guide was pre-tested and focused on developing a unique approach to including a Māori worldview into health promotion (Supplementary file S1). Questions explored key issues for developing sustainable efforts towards health promotion interventions, facilitators and barriers of these efforts and whether a unique approach was needed for Māori. We explored general principles assuming that co-design would be a key element for participants. In fact, analysis of these nine interviews illustrated that co-design was a key contributing factor. Therefore, we decided to develop a new interview guide and focused on the facilitators and barriers in co-designing Māori health promotion interventions, with a particular focus on the HPW framework. After pre-testing, this interview guides a further 10 interviews were conducted by the lead author with the new interview guide. The new interview guide focused on key findings in the initial interviews which were perceptions of co-design, experience with co-design and the evaluation of the HPW framework (Supplementary file S2). The nine initial interviews were not re-done with the revised interview guide as participants identified co-design as a key element and had provided sufficient data for the analysis. We felt the initial interviews and responses provided rationale for developing a more focused interview guide for future interviews. Thus, the nine initial interviews were an 'open approach'

and the follow-up interviews were a 'focussed approach'. All interviews were conducted in English with some Māori included around greetings.

Data analysis

Thematic analysis was used to analyse the data (Braun and Clarke, 2006). Thematic analysis is appropriate for this study as it is a flexible approach that has been used in Kaupapa Māori studies in previous research (e.g. Te Karu *et al.*, 2013). Specifically, thematic analysis facilitates centring Māori perspectives and worldviews while analysing the data. Each transcription was coded by the lead author, who is Māori, and synthesized to create common themes. Specifically, the analysis began with a line-by-line open coding approach. Then, the open codes were reviewed to identify themes through a process of constant comparison and review of content. The themes and supporting quotes were reviewed, revised and confirmed by the other authors.

RESULTS

The results are organized around the research questions. Table 1 presents a summary of the themes and subthemes and an exemplar quote. Pseudonyms are used for all quotes.

Facilitators of effective co-design

The first RQ explored the facilitators of effective co-design. Two key themes were uncovered: collaboration and community voice.

Collaboration

The experience participants had with co-design influenced how they interacted and perceived it. For them co-design is a 'buzzword' and describes a range of participatory experiences. Many participants described experiences with projects that they felt used 'authentic' co-design processes. They shared that collaboration is the base for a good co-design process. Hariata, a Māori researcher, shared:

> It's the idea of having the people on board who to be honest have the most knowledge or understanding about what's needed to address that particular health issue. It requires a facilitator who understands what co-design actually is, but it requires people living with those health conditions, their whanau, and the on the ground workers in that area.

Hariata identified that in the co-design process, collaboration is including all relevant parties in the development and implementation of the intervention. In

Table 1: Exemplar quotes and description of key themes and sub-themes

Theme/sub-theme	Description	Quotes
RQ1—facilitators Collaboration	Demonstrates an approach that encourages learning and collaboration for everyone involved	'So instead of the Ministry coming along with a big prescription, it's been much more of a partnership, you know, where we're at the table with them but we're kind of learning with them.'—Chris
Community voice Autonomy	Allows the communities to identify and provide a solution for what they believe to be the health issue	'If we're truly talking about co-design...it has to be Maori led and has to be Maori driven, and Maori voices have to be the ones that are privileged in all of those discussions, and all of the action that takes place from it.'—Lisa
Involvement	Ensures that the community had just as much contribution in the co-design process as the researchers and health organizations	'The other benefit is that you might identify things that you saw were important, but the community doesn't... don't waste time or money chasing something that there's not a lot of demand for'—Tom
Leadership	Provides community members the opportunity to lead and ensure community benefit	'I think that it's (important)having that one person that's key. I mean, if that person can't relate to the people then it's a waste of time and a waste of energy.'—Jordan
RQ2—barriers Mismanaged expectations Inauthentic co-design	A fashionable label to entice communities into working with research, with the appearance of having full consultation on the project.	I don't think the DHB or the Ministry really understand what we do... they don't understand kind of a Whanau Ora (extended family wellbeing) approach...if you start talking to them around Kaupapa Maori...they just wouldn't see the value in that. —Deb
Under delivering/over promising	Having unreasonable/unattainable goals and not following through with what is promised.	'In fact, one of the worse things.... was to bring expectations up too high, and they would expect more than what we could deliver'—May
Research constraints Jargon	Clinical terminology and research jargon are an obstacle in creating engagement with communities.	'It's finding those messages to engage people...it's probably going to be community or audience-specific'.—Richard
Maori vs. Western approach	Conflicting views on co-design tend to lead to Western approaches dominating Maori narratives, even in Maori communities.	'So what our challenge is... how do we move them (researchers/health professionals) from that very biomedical focus of doing the research just for the research towards "How will this actually make a difference for people and how can I contribute to that difference?"' Heather
Funding	Terms of funding need to allow for more sustainable health interventions/evaluations for Maori/indigenous communities	'So from a funding point of view, we start to need to think about integrating research programme development and evaluation funding in ways that isn't actually done in New Zealand at the moment.'—Richard

(continued)

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Table 1: (Continued)

Theme/sub-theme	Description	Quotes
RQ3—HPW framework		
Advantages		
Placing Maori knowledge at the forefront	Highlights the importance of 'community voice' and 'cultured centered approach'	'I just think that the more we have frameworks which are intentionally developed from a kaupapa Maori frame, the better'—Lisa
Provides guidance	Provides guidance in working with Maori communities, naming what many already do	'In some ways it can help articulate what we do. It's a framework to pin our practice on…I think that it does capture, kind of to me, what kaupapa Maori research should include anyway.'—Petra
Multipurpose	The framework can be used to design, evaluate, and trouble shoot health interventions	'It can mean different things for different people and it can be used in different ways, and I think it's the flexibility of it, which makes it quite powerful.'—Peter
Disadvantages		
Need more case studies	Case studies would provide more guidance on how to physically carry out the use of the framework	'Having some examples of that really practical day-to-day operational, and then how you can use it with the funder or the decision maker, and again having those perspectives from the provider level.'—Maddie
Jargon	The language used in the framework creates barriers to understanding the meaning/vision/goal	'Initially I just thought the framework needed… there's some loose terminology in there, like 'end user' is not a common language.'—Trent
Sustainability	Highlighting how using the framework can create sustainable interventions	'How do we turn this into a sustainable intervention that creates inter-generational change?… They're designed for one point in time.'—Trent

support, Vicky, a researcher in public service across government agencies, offered:

> I think in terms of developing interventions, you need to be really mindful of that balance between everyone… take into consideration those differences and build it into your intervention.

The participants highlighted the importance of collaboration between the professional and the community; each party brings a unique aspect that is facilitated by collaboration. For the participants, collaboration meant being equal partners with shared decision-making and mutual influence on the project.

Community voice

This theme relates to ensuring that the mana (integrity) of the community is always intact and is at the forefront of the co-design process. Participants identified that community voice facilitates an effective co-design process because it improves the quality of the intervention.

Community voice is marked by three sub-themes: autonomy, involvement and community leadership.

Participants believed that the solutions provided needed to be determined by the community to provide a more sustainable outcome; in other words, they have Tino rangatiratanga (autonomy). Māori researcher Petra, discussed the benefits for communities when they are involved in the co-design process: 'The benefits from it (co-design) for people, are they feel like they've got some control over how the service will look and what it will bring to their communities'. Petra raised autonomy as being important in allowing the community to contribute to all the decisions being made and allowing the study to be community directed and community led.

Participants explained that community involvement facilitated the co-design process to ensure the community had as much input as the researchers and health organizations. Jordan, a general manager at a Māori organization, was asked about the receptiveness of Māori to implement health promotion interventions and

replied: 'If they're a part of it: designing, co-designing, very receptive. They're a lot more receptive especially if they're part of the co-design. It's empowering them to make decisions that they think are best for themselves'. Jordan noted that the involvement for the community enhances their experience in co-designing with other non-community members.

Participants also identified community leadership as critical for allowing better co-design of the health promotion intervention. One of the participants, Faye, a general manager for a health organization shared in response to what helps to facilitate co-design with communities: 'we need to actually get the community leaders to help champion that to encourage to people to come along'. Faye highlighted the importance of the community leadership roles when trying to encourage the community to get involved in the intervention. Community leaders become a bridge between the implementers and the community to ensure that there is mutual respect and understanding.

In sum, the two facilitators are collaboration and community voice. Collaboration is a facilitator because it integrates the different worldviews during the co-design process. Community voice is a facilitator as it ensures autonomy, involvement and community leadership by putting community ideas at the forefront.

Barriers for co-design

The second RQ focussed on the barriers of co-design. There were two themes: mismanaged expectations and research constraints.

Mismanaged expectations

This theme highlighted the importance of the researchers' and health professionals' interactions with the community to create appropriate expectations when using a co-design approach. Two sub-themes emerged: inauthentic co-design and over promising/under delivering. Inauthentic co-design was described by the participants as using co-design as a fashionable label to entice communities into working with the implementation team. The intervention would have the appearance of having full participation on the project, when in fact it did not include participatory aspects. Jane, a researcher, shared an experience she had when implementing a health promotion intervention with a community and health professionals:

> The thing that pisses me of the most is people writing about co-design and you just know they didn't do it. They just thought they did because they put an advisor on their team or something.

For Jane, the inclusion of an advisor is insufficient to have effective co-design. Alongside other participants, she identified that inauthentic co-design reflects a clash of different goals and visions between the community and the implementers; the community wants to be included as partners throughout the process, whereas the implementers are looking for quick consultation about what they are doing.

Another barrier for participants was over promising and under delivering to the community. Participants identified that when you over promise it creates false hope within the community which can negatively affect the engagement from the community. A professor/researcher in public health, Tom, acknowledged the challenges when co-designing health promotion interventions with communities and the concerns around raising expectations:

> We came up with a whole lot of recommendations that were probably overambitious, which is partly why not a lot got done. So, you raise the expectations in the community about what you could do, but then whether that can be achievable is always the challenge, isn't it?

For Tom, under delivering to the community can impact the trust built between the community and co-design team which not only affects the current relationships, but the future relationships too.

Research constraints

That nature of research and the constraints of funding also serves as a barrier for effective co-design. Both researchers and health professional participants identified three constraints: jargon, Māori vs. Western approach and funding.

The use of medical terminology and research jargon was identified as creating confusion and disinterest within the community. Jargon specifically addresses the communication barriers between the researcher and health professional and the community. The researchers and health professionals often used a lot of jargon in their messages and their sharing of knowledge. Mahina, a Māori health organization manager, was asked what characteristics would address a communication issue. She responded: 'The challenges are for clinicians to be able to leave their professional language at the door, and be able to talk in general terms, so that whānau understand what they're on about'. For Mahina, using terminology the communities are familiar with would allow for more effective communication.

Participants identified that Māori vs. Western approaches differ in many ways in relation to health. Māori approaches were described as often focused on

the collective and are holistic, while Western approaches were described as often focused on the individual and the physical. Participants believed Western approaches dominated Māori narratives leading to conflict views about co-design. Faye explained:

> Maori approaches are not validated in the same way that it should be and that's because science is so influenced by that whole western paradigm.

Faye and others noted that when co-designing with Māori communities, the challenge is prioritizing the community's approach to enhance the overall outcome of the co-design approach and project.

Funding constraints were mentioned by many of the participants as an ongoing barrier for the sustainable aspect of co-designing a health promotion intervention with communities. Funding constraints includes length of contracts and who controls the funding. Deb, general manager for a Māori health provider, was asked if she thinks there is a need for a unique approach to developing solutions that work for Māori and she replied:

> For too long it's everything we've done has been driven by the government and by contract that comes through the government…sometimes you can have something going really good, a programme or project or something and then the DHB, or the Ministry or the government agencies get hold of it and then they start taking control of it and then suddenly it's completely different to what you were doing.

Deb focused on the barrier of funding being controlled by others particularly when the funders begin to dictate the direction of the programme to abide by their guidelines. Deb felt that such control inhibited communities desire to sustain a health promotion intervention.

In sum, the two barriers for co-designing interventions with Māori communities are managing community expectations and working within research constraints. Expectations can be raised to a high level for a community when they think they will be able to co-design an intervention. Making sure the process is authentic and not over promising (and then under delivering) can help manage those expectations. Furthermore, researchers and communities have to work within the confinements of research. While they cannot change the terms of funding easily, they can work to make sure that Māori perspectives are included and that the partnership is relatively jargon free.

HPW framework and co-design

The third RQ explored the advantages and disadvantages of the HPW framework as an approach for effective co-design of health promotion interventions with Māori communities. Participants identified three advantages and three disadvantages.

Advantages

The three advantages included placing Māori mātauranga (knowledge) at the forefront, providing guidance and multipurpose. Participants acknowledged that the HPW framework emphasizes culture-centred knowledge, and ensures community voice when co-designing with Māori communities. May, a community health worker, shared her impressions of the framework: 'It's self-determinate, and it's Indigenous; it's based on core cultural values, and you go from there, so it's a good framework, but it's a Kaupapa Māori framework'. May and other participants shared that the research conducted from this framework could privilege the Māori/community voice.

Participants also noted that HPW provides guidance on how to carry out specific tasks ensuring that key aspects in the co-design process are fulfilled. Mahina was asked how she would use the HPW framework, she replied:

> To me it's a model. Yeah, a model is a set of principles that guide your process, and has some boundaries and scope around it, and you've got some key areas that you want to group things in, just to get order and logic and keep you on task.

Participants like Mahina saw this framework as particularly important for researchers who endeavour to work with Māori communities who lack experience in doing so. Participants further highlighted that some of HPW principles are providing names for what many are already doing when working with Māori communities and thus it resonates with the guidance they would offer.

Participants spoke of how versatile the HPW framework can be; some spoke of its potential to be used to assist in the design or the evaluation of a health promotion intervention, while others spoke of its use as a tool to translate research to practice. Trent, a community health worker for a DHB, shared how he perceived the HPW framework to be a good evaluation tool: 'This is awesome for like a process evaluation. This framework is epic for process evaluation in term[s] of how the implementation went'. Participants identified that the HPW framework has multiple functions that help meet various needs of researchers, health professionals and communities working in a co-design space. This theme highlights that the framework is flexible so that it does

not limit the users' perspective on how it should be used or when to use it.

Disadvantages

The three disadvantages were the need for more case studies, jargon and sustainability. The first disadvantage was limited evidence of the use of the framework. Hariata, was asked what she thought of the HPW framework and replied: 'The evidence; you know you've got community engagement and this kind of systems thinking, and it's targeting at levels. So what is the evidence behind what you're trying to develop?' Hariata highlighted that the evidence behind the framework is key to ensuring the users believe that the principles in HPW will provide positive outcomes. Participants felt the lack of resources or case studies on how to use the framework may inhibit the use of HPW.

Participants identified a disadvantage of the terminology used in the framework. The language used had the potential to create barriers to understanding the framework. Jane provided her perspective on some of the language used: 'Yeah, it doesn't invite. If you don't know that language, if you're not immersed already in that language and in that style of presentation and stuff; there's nothing in there that allows you to get in and make it yours'. This theme recognizes that the framework has some jargon included that is specific to researchers; community members involved in the co-design approach may find the language difficult to understand and therefore a barrier.

The final disadvantage relates to sustainability of interventions for the communities. Participants noted that it is important to include how the co-design process of creating an intervention will have sustainable outcomes. They believed that in order for the framework to assist in this area more guidance is needed. Maddie, shared her feedback on the framework: 'Is it cost affective? Can it be sustained? Those sorts of things aren't in there. I think that's another issue for many Māori providers; is that it comes in and out. It might be working but it's dropped'. For Maddie, the sustainability of interventions is critical and she is looking for greater evidence that the framework can lead to sustainability.

In sum, participants saw advantages of the framework in putting Māori knowledge at the forefront, providing guidance and being multi-functional. Thus, they see potential for this framework as being a facilitator for a co-design approach. At the same time, there are some challenges in needing to have more evidence of its effectiveness. Furthermore, the jargon that is included needs clarification to be an effective framework for

communities. Finally, the framework needs improvements in the sustainability aspects of implementing a health promotion intervention with Māori communities.

DISCUSSION

This study aimed to explore the facilitators and barriers towards co-design of health promotion interventions with Māori communities identified by health professionals and researchers in New Zealand. This study also aimed to explore the implications of the HPW framework when co-designing a health promotion intervention. This section discusses the findings in relation to the extant literature and identifies key implications of the findings.

The facilitators for co-design in this study were collaboration and community voice. Collaboration supports communities who historically have been excluded in the discussions and design of community health promotion interventions (Mosavel *et al.*, 2005). Community voice facilitates authentic co-design as it brings the unique perspectives from community members that researchers, or health professionals, may have overlooked (Simonds and Christopher, 2013). For researchers, health professionals, and community partners, collaboration and community voice ensure that everyone involved in the co-design process has a clear understanding of the goals, vision and implementation processes of the health promotion intervention (Wallerstein *et al.*, 2018). Putting community ideas at the centre of a co-design process, and ensuring they are acknowledged and developed is a key facilitating aspect of co-design (Wallerstein and Duran, 2010). The themes highlighted the integral role community members play in creating a beneficial health promotion intervention. When the community feel they have shared ownership of the intervention, it can lead to sustainable health promotion interventions and outcomes.

The barriers of co-design in this study were mismanaged expectations and research constraints. Mismanaged expectations reflect how organizations can raise the expectations of the community by being inauthentic in their co-design processes or 'over promising' and 'under delivering' the health promotion effort that has been stipulated. These expectations are consistent with previous research illustrating that poorly managed co-design processes can have negative outcomes for Indigenous communities (Wallerstein and Duran, 2010). For example, inauthentic co-design can cause frustration and distrust amongst the core designing team (Lucero *et al.*, 2018). Also, in co-designing a health promotion intervention within the field of research, there are

always constraints that the community and wider co-design team must address. Collaborative partnerships are logistically complex, and given the competing values of communities, health organizations and researchers, challenges and conflicts may arise (Wallerstein *et al.*, 2018). The constraints of funding and mixing western and Māori perspectives creates additional challenges to creating an authentic co-design intervention (Durie, 2004b; Wallerstein *et al.*, 2018). These barriers highlighted that co-designing health promotion interventions can be chaotic and exhausting for those working with the communities, and the community members themselves.

The HPW framework was seen by participants as having both advantages and disadvantages as a tool for co-design. A positive aspect of it is that it puts Māori knowledge at the forefront and acknowledges the uniqueness of a Māori world view, consistent with prior research (Smith, 1999). This is significant as HPW becomes a guide for researchers who are unfamiliar with an authentic co-design process when working with Māori; it is a framework that is relevant to a Māori group by prioritizing Māori values, traditions, practices and language (Prout, 2012). Moving forward participants identified that more evidence was needed to support that the framework is workable and to demonstrate how it can be used in different situations. There is a growing body of evidence for the HPW framework although it is still in its infancy, so future research is needed to validate the effectiveness of the framework (Harding and Oetzel, 2019; Oetzel *et al.*, 2017).

Co-design, and related participatory approaches, is a popular approach for health promotion interventions, particularly with Māori communities (Durie, 2004a; Wise *et al.*, 2012). This study has implications for health promotion interventions as it addresses key facilitators and barriers to co-design from the perspective of health professionals and researchers. In particular, it identified the concerns of inauthentic co-design and the need to have engaged community voices. It highlighted the importance of community involvement throughout the co-design process with the potential to achieve more sustainable health promotional outcomes. Finally, this study offers some support for the HPW framework as providing a guide for authentic co-design, although more evidence and clarification of jargon will be needed. Future studies should focus on the perception of the community towards co-designing health promotion interventions; these studies should aim to determine if similar facilitators and barriers are identified. Such research would provide more evidence of co-design being a preferable option for engaging with Māori communities.

A limitation of this study is that there were two different structures of interviews designed to further explore co-design. However, the interviews did provide corroboration as there were similar themes. Another limitation is that the majority of the participants interviewed had experience in co-design. Therefore, the voices of those whose research or practice does not involve co-design processes may not be fully represented in this study. Finally, as this is an exploratory study, it has focused on the themes associated with co-design and not the specific processes.

CONCLUSION

In conclusion, co-design approaches have evidence of their effectiveness in addressing health inequities for Indigenous communities. However, there is limited use of co-design in designing health promotion interventions in New Zealand. When co-designing a health promotion intervention with Māori communities it is important to ensure intentions and expectations are communicated effectively between all parties. Furthermore, collaboration between all parties empowers community voice allowing for equal input into the implementation of the health promotion intervention. This study identifies that the HPW Implementation Framework shows potential for improving the design and implementation of health promotion interventions with Māori communities.

SUPPLEMENTARY MATERIAL

Supplementary material is available at *Health Promotion International* online.

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Appendices

Appendix 1: Interview Guide 1

We are trying to understand how a Māori Implementation Science might develop, grow and become established within health policy and service delivery.

Māori Implementation Science is an emerging idea in New Zealand, and is a catch-all phrase to describe a collection of frameworks, methodologies and methods focused on developing sustainable and effective solutions to health issues that affect Māori. Through the He Pikinga Waiora project, we are learning what Māori Implementation Science might involve as there is no consensus over what the term means.

Opening

To keep today's discussion as concrete as possible we would like to focus on prediabetes.

1. Tell us about yourself and what issues you might see in developing effective and sustainable solutions to prediabetes that work for Māori
2. Do you think there is a need for a unique approach to developing solutions that work for Māori?
   a. probe for reasons behind 'yes' or 'no' and maybe ask describe the next five years with or without Māori Implementation Science
   b. If yes, what characteristics would a Māori Implementation Science approach need to address an issue like prediabetes? And how would these be different from the current ways we develop mainstream health policy or health services?
      i. probe: who ought to benefit, who ought to have control over how the capability is developed and used, and what expertise would be required
   c. If no, what would be required to ensure that Māori benefit from mainstream health interventions that target prediabetes?
3. How receptive would the current ways we develop health policy and/or health services be to a Māori Implementation Science approach?
   a. Where would the main blocks lie?
      i. probe: who, when, how etc
   b. Where would the main enablers lie?
      i. probe: who, when, how etc
4. What supports people try new and risky things?
5. How might we develop knowledge about Maori implementation science?
6. How might people learn about Maori implementation science?
7. Whose expectations should shape work on Maori implementation science?
8. How do we stimulate demand amongst health policy and health managers for Maori implementation science?
9. What makes Maori implementation science a good thing, and in whose eyes?

10. What specific recommendations would you make to help develop, diffuse and embed Māori Implementation Science?

Wrap and Close

Any other comments?

Appendix 2: Interview Guide 2

Questions

The following questions are tentative interview questions for data collection: There are many health interventions that have been created that have proven to be effective. The following questions look at your perspectives on co-designing health interventions with Māori communities. We are also trying to understand how a Māori Implementation Science might develop, grow and become established within health policy and service delivery. The first group of questions explore your general perceptions of co-design, while the second group of questions explore your perspectives of a Māori implementation framework.

Opening

- Check participants protocols
- Whakawhanaugatanga
- Intro the research – reminder of info sent/ consents etc
- Thank participant for agreeing to take part

Section 1: Co-design

1. Have you heard about co-designing health interventions?
   a. What is your experience of co-deisgn?
2. What is your idea of co-design? What does it look like?
3. What are the benefits of a co-design process particularly working with Maori and Pacific communities?
   a. Can you provide an example to illustrate? (if they have experience)
4. What are the challenges of a co-design process working with these communities?
   a. Can you provide an example to illustrate?
5. Why or why not would you use co-design?

Section 2: He Pikinga Waiora Framework

(Provide a physical copy of the framework if the participant does not have their copy on them)

1. What are/were your initial thoughts of the HPW implementation framework?
2. When would you use it?
3. What are its advantages? And disadvantages?
4. What would be the biggest challenge in implementing the framework?
5. Are there any changes that you would suggest to it to enhance its usefulness?
6. What resources would you like to have to use the HPW framework?
7. Would you recommend the framework to others?
   a. Why/Why not?

8. Any other thoughts?

Wrap

Those are my questions, do you have any questions of me?

What else would you like to say?

Explain where-to-from-here.

Thank the participant; offer a koha for the provider and ask the participant how they would like to close.

Chapter 5: Identifying the facilitators and barriers in disseminating and adopting a health intervention developed by a community-academic partnership

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Abstract

The literature regarding implementation science of evidence-based health interventions in Māori communities is limited and there is a push for new and innovative delivery methods of health interventions in New Zealand. The purpose of the study was to identify the facilitators and barriers in implementing a health intervention designed by others and was framed by the Consolidated Framework for Implementation Research (CFIR). This study explored general perceptions of the implementation process and also included a case study, the Kaumātua Mana Motuhake (KMM; older people's autonomy and self-actualisation) project; a co-designed peer education intervention for older Māori. Semi-structured interviews (N=17) were conducted via face-to-face, phone or zoom with health and social service professionals with experience working with Māori communities. Thematic analysis was used to analyse the data. The facilitators included community engagement, programme structure, programme adaptability and creators' experience. The barriers consisted of funding access, funding constraints and organisational constraints. The findings support key elements within the CFIR, highlighting the importance of community engagement and adaptability. Additionally, this study identified nuanced aspects of funding and resources that constrain organisations in employing health interventions designed by others.

5.1 Introduction

Māori are the Indigenous people of Aotearoa/New Zealand and comprise about 17% of the total population and they face some of the greatest health inequities in New Zealand. For example, in an audit of primary care and diabetes support programme, Māori experienced greater potentially avoidable hospitalisations and higher mortality rates within 30 days of undergoing surgery compared to non-Māori (Yu et al., 2020). Substantial inequities were also observed in deaths from diabetes (Māori five times greater mortality than non- Māori), and with circulatory and respiratory conditions (non-Māori dying at approximately 40% the rate of Māori) (Yu et al., 2020). Racism, income, lower access to health care, and high proportion living in rural settings are key social determinants to explain these inequities (Ministry of Health 2016; Stanley, Harris, Cormack, Waa, & Edwards, 2019).

Health equity is a significant concern in New Zealand with attention and resources from the government, health system and healthcare workers dedicated to enhancing it. For example, the mission-led National Science Challenges (NSC), particularly those focused on health and wellbeing, have a stated goal of reducing the burden of health inequities faced by Māori (Ageing Well NSC, n.d; Healthier Lives NSC, 2016). Researchers associated with these NSC have developed evidence-based interventions (EBI) to address diabetes, cardiovascular disease, obesity, health ageing and other health conditions (e.g., Pylypchuk et al., 2018) including some that have been co-designed through participatory methods with Māori communities (e.g., Ni Mhurchu, 2019; Oetzel et al., 2020). EBI are critical to address health outcomes and health equity and they are seen as more efficient than designing a new intervention for a particular community or provider (Lhachimi, Bala, & Vanagas, 2016). However, they often require adaption to a new context, particularly for cultural fit (Kirk et al., 2020). Further, there are additional challenges around disseminating and implementing EBI to other contexts including implementation process, scaling up and sustainability (Harding & Oetzel, 2019; Milat, Bauman & Redman, 2015). A key to understanding these implementation challenges for Indigenous communities is to understand the facilitators and barriers to implementing EBI (Gibson et al., 2015).

Facilitators and barriers to implementation need to be understood within a larger implementation framework. While there are a number of implementation frameworks, this study uses the Consolidated Framework for Implementation Research (CFIR). CFIR is a comprehensive framework that integrates 19 different theories or models of implementation

science (Damschroder et al., 2009). It has been widely used in various implementation contexts (Kirk et al., 2016), including in Indigenous communities (Sebastian, Thomas, Brimblecombe, Majoni, & Cunningham, 2020).

There are five key domains in the CFIR: intervention, inner setting, outer setting, individuals involved, and process (Damschroder et al., 2009). Intervention refers to its characteristics including supporting evidence, relative advantage, compatibility, complexity, trialability and observability (Rogers, 2003) as well as whether the intervention has been adapted to the local context; adaptation relates to both core functions and forms or peripheral features (Kirk et al., 2020). Inner setting includes the organisational characteristics and support from where the intervention is implemented. The outer setting refers to the larger political, social, structural and economic context where the organisation is located (Damschroder et al., 2009). Individuals are the people responsible for implementing the EBI and this domain includes individual skills, cultural values, affiliations and mindsets. Process refers to the means of implementation; processes involve multiple people and occur among multiple levels of the settings (Damschroder et al., 2009).

The literature regarding implementation science of EBI in Māori communities is limited. Further, even when an intervention has been culturally adapted or even created for a particular cultural community, it is unknown whether the EBI can be implemented directly or whether adaptations are needed prior to implementation. This is particularly important in New Zealand where there are more than 100 different iwi (tribes) and hapū (subtribes) with variations in cultural practices and some negative histories.

The purpose of the study is to identify the facilitators and barriers in implementing an evidence-based health intervention developed by one community organisation to another community organisation. In particular, this study examines general implementation of EBI to Māori communities, but also a specific EBI co-developed by a Māori organisation and university research team (Oetzel et al., 2020). The research questions for this study were as follows:

1) What facilitators do health professionals in New Zealand identify when implementing an evidence-based intervention designed by others?
2) What barriers do health professionals in New Zealand identify when implementing an evidence-based intervention designed by others?

5.2 Methods

The research design was an interpretive interview design guided by Kaupapa Māori methodology (KM). KM normalizes Māori knowledge, language, customs, and practices in research and emphasises trust and relationships with participants and collaborators (Pihama, Smith, Taki & Lee, 2004). KM recognises the history of colonisation and the importance of cultural integrity when analysing Māori issues and provides the tools to facilitate a Māori understanding of the political and historical context of Aotearoa (Pihama et al., 2004). Research that employs KM aims to create positive outcomes for Māori communities and thus is action oriented (Barnes, 2000). Barnes (2000) observes that Māori preferred interests have been dominated and excluded by Pākeha (non- Māori; primarily New Zealand European). KM works to remove these threats to the Māori culture by arguing that in order to understand, explain or respond to Māori issues there must be an approach that is embedded in Māori epistemologies or ways of knowing (Pihama et al., 2004). Even though KM works to decolonise Western research approaches and methods, it still holds space for non-Māori researchers to engage with and create research that allows those (researchers and participants) involved to feel comfortable and to focus on benefit for Māori communities.

This exploratory study used a locally-developed evidence-based health intervention as a case study. The case was presented to participants as an example of a successful health intervention that they then explored how it might be adopted in their communities. The case was the Kaumatua Mana Motuhake (KMM) project; a co-designed peer education intervention for older Māori (Oetzel et al, 2020; Simpson et al, 2020). The purpose of KMM was to enhance the capacity of kaumātua (older Māori) serving as peer educators and to enhance the hauora (wellbeing) and mana motuhake (self-actualisation and autonomy) of the recipients who faced various life transitions (e.g., loss of spouse, change in health condition). It was developed using KM through a collaboration of university and community researchers, two advisory boards, and kaumātua including development, implementation and evaluation of the intervention. It also reflects Māori epistemology in defining the nature of a peer relationship and how information should be shared.

The research design was an interpretive interview design guided by Kaupapa Māori methodology. Kaupapa Māori methodology normalises Māori knowledge, language, customs, and practices (Pihama et al., 2004) in research. Research that employs Kaupapa Māori aims to create positive outcomes for all participants involved (Barnes, 2000). A Māori world view guided the methods to ensure a culturally-safe environment for the participants and researcher.

This exploratory study used a locally developed health intervention as a case study. The case was presented to participants as an example of a successful health intervention that they then explored how it might be adopted in their communities. The case was the Kaumatua Mana Motuhake (KMM) project; a co-designed peer education intervention for older Māori (Oetzel et al., 2020; Simpson et al., 2020). The purpose of KMM was to enhance the capacity of kaumātua (older Māori) serving as peer educators and to enhance the hauora (wellbeing) and mana motuhake (self-actualisation and autonomy) of the recipients who faced various life transitions (e.g., loss of spouse, change in health condition). The intervention was a collaboration of university and community researchers, two advisory boards, and kaumātua including development, implementation and evaluation of the intervention.

5.2.1 Sampling

Participants were health and social service professionals who worked in Māori and non-Māori health organisations throughout New Zealand. Māori health organisations are grounded in a Māori worldview, although both serve Māori communities. The inclusion criterion was whether participants had experience in implementing, adapting or adopting evidence-based health interventions designed by others in their own organisations and communities. Previous engagement with the KMM project was not an inclusion criterion. Recruitment used snowball sampling which benefits from interpersonal relationships and networks to contact other people who may provide further insights, which consistent with KM given its focus on relationships (Pihama et al, 2004). Potential participants were initially contacted via email and phone calls. Seventeen health professionals were interviewed; 12 women and five men; 12 Māori and five non-Māori; seven general managers, four CEO's, three community health workers, an advisor, a clinic manager, and a director. A supplemental file provides a table of the participants demographic details. Direct incentives were not provided; however, consistent with Māori cultural practices, snacks, tea and coffee were provided for face-to-face interviews.

5.2.2 Data Collection

Given this project sought to elicit personal experiences, perceptions and opinions about adapting or adopting EBI in general as well as the KMM intervention specifically, semi-structured interviews were chosen (Barriball & While, 1994). Semi structured interviews relate to KM by allowing participants to share their knowledge, whether it is cultural or not, in a safe environment that will bring no harm to them (Pihama et al, 2004). Interviews were conducted via face-to-face (n=7), phone (n=2) or zoom (n=8). Interviews conducted via media were convenient and flexible, and the ethical issues and processes being similar to face-to-face interviews (Janghorban, Roudsari & Taghipour, 2014). Participants provided informed consent process and interviews lasted on average 45 minutes. They were recorded and transcribed. The Human Research Ethics Committee at the lead author's university approved this study (FMIS 16/19).

The interview guide (see appendix) was organised in three sections: a) general experiences of adopting/adapting health interventions designed by others; b) perceived facilitators and barriers in implementing health interventions designed by others and; c) general perceptions of adopting/adapting the specific KMM project within participants' organisations. A brief report of the KMM project was provided to participants and discussed by the interviewer. The interview guide included open questions about participant experiences and perceptions with probes about key categories associated with the CFIR and implementation science literature (i.e., intervention, organisation, context, process, and individuals). The guide was not directly adapted from previous research, but was created with the grounding of the extant literature and the research questions in mind. The interviews were conducted by the first author, a Māori researcher with expertise in semi-structured interviewing and KM research methodology.

5.2.3 Data Analysis

Thematic analysis enabled exploration and interpretation of the various aspects of the topic and provided a rich and detailed breakdown of the data collected (Braun & Clarke, 2006; Simpson et al., 2020). Thematic analysis complements KM principles through its open approach (Simpson et al., 2020). Further, thematic analysis is adaptable to uphold Māori values, beliefs and traditions so as to cater to the nature and cultural aspects of this study .

The research around identifying facilitators and barriers to adapting or adopting EBI has multiple interpretations, as well as the opportunity to generate themes that go beyond the personal experiences of the participants. The data was initially coded and re-occurring patterns were identified to develop key themes. Attention was paid to any demographic differences in themes (ethnicity, gender and position) although no distinct patterns were identified. The analysis was completed by the first author and then corroborated by the other authors. Further, findings were shared with members of an academic/community research partnership with experience in implementation of EBI for a validation check with no major changes to themes requested.

5.3 Results

This section is organised around the two research questions. Table 1 presents a summary of the themes each with an exemplar quote. Pseudonyms are used for all participants.

Chapter 4 - Table 1: Exemplar Quotes and Description of Key Themes

Theme	Description	Quotes
RQ1: Facilitators		
Community Engagement	The creators and end users must build relationships with community members to ensure acceptance of the original intervention.	*"That's about engaging with your client base and making certain that their needs are met, and it also gives the community the feeling of love and caring and that people do care about them and think about them." (Tracy)*
Programme adaptability	Being able to adapt interventions that have been designed by others to better suit the communities they serve is a facilitator of adoption.	*"There were lots of other things that weren't in the intervention that we did with our kaumātua because we were looking at their lives holistically – from a Māori viewpoint." (Clint)*
Programme Structure	Having a well-established structure for the intervention designed by others is an enabler to using the intervention.	*"We've actually taken heaps from the original team because they've done their systems and stuff so amazingly." (Mary)*
Creator's experience	The experiences the original project could provide for end users wanting to implement the intervention in their communities.	*"So, if you can provide kind of a fuller explanation of how it all works, plus any resources, if you have like a training manual for tuakana, to help them understand their role as a mentor, or a process that they work through; it would make it a great deal easier to pick up." (Michelle)*
RQ2: Barriers		
Funding access	How funding affects end users wanting to take the intervention on board.	*"It would require some seed funding to get it off the ground in a new area. If you're going to develop something new, it takes time and staff time costs money." (Karen)*
Funding constraints	The limitations of the funding and the impact it has for the end user on the implementation of the programme.	*"There's not an equity lens in the funding formula, you know what I mean? So we can't generate a lot of money to pay for all the things that we wanna do." (Danielle)*
Organisational constraints	The resources that would affect the implementation of the intervention in different organisations.	*"I think it's the usual, probably around simply finding the time and resource to implement something new; so that can be a barrier." (Josephine)*

5.3.1 Facilitators

The first research question explored the facilitators when implementing an intervention designed by others. The key themes were: community engagement, programme adaptability, programme structure and creators' experience. The themes are inclusive of general experiences and specific examples participants drew from the KMM project. In the themes, a *creator* has developed the intervention and *end user* is the entity/organisation considering adopting the intervention.

Community Engagement. Participants identified the importance of end users building relationships with community members to ensure acceptance of the new intervention. Participants were clear that in order for interventions designed by others to thrive, community engagement was essential to ensuring the positive outcomes and sustainability of the intervention. Tash, a general manager at a Māori health organisation shared:

> *"The majority of them were programmes that had some quite specific guidelines in regards to what they wanted to see happen, and the outcomes that they wanted. However, we were able to work with the whānau (extended family) so that they would be more user friendly, if you want to use that word, in regards to Māori whānau specifically."*

Tash believes that by involving the community members in the adaptation of the intervention from its original idea to fit the community, it will have better outcomes for the community the end user is serving.

Furthermore, participants believed that the relationships built by end users and the community encourages better interventions in which the community members can engage. This facilitates the implementation of an existing intervention by making it culturally relevant. Tane, CEO of a Māori health organisation, supported this view:

> *"What we tend to do is take Pākehā (Western) mainstream programmes and then say, 'Thank you. Thank you for that programme. Thank you for that money, now we're going to wrap our Kaupapa Māori lens and work with our whānau because it doesn't work for our people.'"*

Tane reinforces the idea that engagement with the community is the key to a successful intervention regardless of funder needs and the intentions of the creator of the intervention.

Programme Adaptability. Another important facilitator, and related to community engagement, is that end users want creators to ensure the intervention could be adapted in order to reflect the community who would be using it. Participants shared how their organisations adapted interventions that have been designed by others to better suit the communities they serve. Michelle, a director for a health organisation shared:

> *"You have to look at the cultural context in which you're working, and the particular issues of that community… you can take the ideas and the frameworks and then if the community identify that's what they need, want, or think is important, then allow them to fit within the way that they are working or what their priorities are."*

Michelle highlights the importance of adapting the intervention to the cultural context. By adapting the intervention to the community, it realigns the intervention to the priorities of the community.

Jane, a health promotion manager, reinforced this adaptability theme and mentioned how she would adapt the KMM project to the physical locations of their community: *"Instead of them sitting down and having a conversation it would be taking them to the beach and letting them share their whakaaro (thoughts) on a brisk walk along the beach or something like that."* Similarly, many other participants shared that they would feel more comfortable implementing the KMM project if they would be allowed to make relatively minor changes to the programme to suit their communities.

Programme Structure. Participants' experiences with implementing health interventions designed by others identified a well-established structure for the intervention as an enabler to adoption. Participants shared that the intervention structure provided reliable information as to how the project had previously worked. Linda, an advisor for a charitable health organisation shared, *"It provides a really simple how-to; so, what does this look like, how is it done, what have we learned so far by doing this, and what tools and resources have been developed in this programme."* Linda explained the structure provides an insight into what the creators have learned and offers a format for others.

When participants discussed structure in relation to the KMM project and in particular an ageing population, they reinforced the points from Linda. Yvette, a general manager at a Māori health organisation offered, *"I think we'd need the framework of the programme and how that was set up by the original crew."* It was important for participants to see the structure of the intervention and the processes the creators went through when implementing it, particularly with an ageing population. The "how tos" of the programme enable the organisation to have a blueprint of how it can work and thus make it easier for them. The structure of an intervention designed by others is a facilitator as it offers reliable and trustworthy information regarding the intervention.

Creators' experience. A final facilitating aspect was the supporting resources the creators could give end users by coding their experiences. Participants highlighted that it might be useful for members from the original project to speak to the end users and/or the communities involved to provide insight into the programme. Tane explained, *"I think there would be an appetite around coming and talking to the programme around the shared experience and articulate what the benefits have been, giving an insight."* Similarly, many participants identified that the experiences the administrators from the original programme could share would provide valuable information for the implementation with their communities.

When discussing the KMM project participants shared their thoughts on what the project could offer to facilitate the dissemination. Emma, a clinic manager for a Māori health organisation shared:

> *"Maybe it's kind of like having a little workshop somewhere, where you bring along some of the people who have been doing the programme maybe even some kaumātua, to talk to a small group of people who are thinking about the programme; so that they're almost mentoring them into it as well, and sharing the knowledge and the learnings."*

Emma highlights including those who ran the programme and those who have personally experienced the intervention as being able to provide mentoring throughout the dissemination and implementation process. Overall, the participants were open to having support from the original group and considered the potential benefits that would come with their experience.

5.3.2 Barriers

The second research question explored the barriers when implementing an intervention designed by others for an ageing population. The themes identified were: funding access, funding constraints and organisational constraints.

Funding access. A concern for many participants was accessing funding and the length of time programmes usually take to implement; without funding it would cause a financial strain on the end user and the programme may not come to fruition. Josephine, a clinic manager for a Māori health trust, shared: *"No, we can't carry it (intervention) out without funding, because it's for too long."* This was also supported by Yvette who shared: *"we're gonna need some resource funding no doubt about that."* Participants were clear that if they were to take on a project there would need to be funding.

Participants were asked if funding would be a barrier for implementing the KMM project in their communities. Jane responded: *"Without the funding we couldn't do it, if that's what you mean, without this particular contract because that gives us the capacity to have a full-time staff member in there."* This was a common perspective among participants who believed that the programme would require funding, that without, the project would not reach its full potential. Participants shared that funding always impacts implementing health interventions; the money that backs the programme is just as important as the programme itself.

Funding constraints. Participants identified the barriers funding constraints have on implementing any intervention designed by others. One such was the restrictions that came with funding for implementing interventions designed by others. Clint, a general manager of a Māori health unit shared his experience:

> *"The fact is, is that if we had applied for funding elsewhere… we would have had our programme according to the needs of those kaumātua because they would have had an input into how the programme should be run. But because the funding was provided by the DHB (District Health Board) that took away that ownership."*

Clint explained that their funding required them to stick to strict guidelines provided by the funders. Participants identified that funders had an influence in how the programme would be run which at times excluded the community voice and potential adaptability of the intervention to fit the community needs.

In relation to the KMM project participants discussed the need for flexibility of the funding. Linda shared, *"There'd have to be funding attached to it and then it would be viable in terms of how it could work; and I could see how it could work."* Linda and other participants felt that while funding was important for the programme, the terms of said funding would need to allow for end users to use the funding within their means and goals. Participants were weary that by taking on KMM (and other interventions) end users would be reliant on funding and did not want that to impact their autonomy over how the programme would look for their communities.

Structural resources. Another identified barrier was the human and organisational resources that would be impacted to implement the intervention in their communities. Participants were wary of the limits in their workforce and their own organisation's capacity when taking on a new intervention such as the KMM programme. Tamati, a regional Māori health manager, shared his personal experiences: *"But the challenge is in terms of Māori workforce, it's a real limited resource and our kaimahi (workers) Māori and our workforce are getting older."* Tamati and others perceived staffing to be important as end users who are engaging with Māori communities need staff with cultural capacity to provide this programme.

Another aspect was the additional resources (such as a training programme) that end users tend to lack when implementing health interventions designed by others. Pearl, a CEO of a Māori trust, shared her ideas on how to combat this barrier:

> *"I would think a little kete (resource kete) of all the things – like what does the training programme look like, how do you go about setting them up? Sort of the 'how to' and the actual physical resources that will help."*

This participant identified the practical resources the original programme could provide for end users to remove this barrier.

5.4   Discussion

This study aimed to explore the facilitators and barriers health professionals in New Zealand identified when implementing a health intervention designed by others. This study also included an evidence-based intervention, the KMM Project, for participants to draw on and provide specific examples on the facilitators and barriers they would face implementing

the project in their communities. The key themes from the study are discussed in relation to the CFIR and other related implementation science literature.

The key facilitators for participants centred on the intervention, external support, process and adaptability. These largely reflect CFIR categories with the exception of individuals, which was not a key theme with our participants (Damschroder et al., 2009). In terms of the intervention and external support, participants reported that the structure of the programme and creator experiences are facilitators for adoption as they provide evidence and reputable data to remove any concern end users may have about the relevance of the health intervention. These themes provide observable experiences and evidence of effectiveness to determine whether the intervention makes sense for the community (Damschroder et al., 2009; Rogers, 2003). Further, creator experiences that are shared directly with administrators and community members provide direct external support; they allow prospective organisations to see the value of the EBI and the support the creator can provide, which increases likelihood to adopt the health intervention (Mendel, Meredith, Schoenbaum, Sherbourne & Weels, 2008).

A further facilitating aspect is whether there is a process of community engagement during implementation (Damschroder et al., 2009). Community engagement is a key element of dissemination and implementation, particularly when working with Indigenous communities (Harding & Oetzel, 2019; Oetzel et al., 2017). A specific Indigenous implementation framework, the He Pikinga Waiora framework (Enhancing Wellbeing), emphasises the importance of participatory and co-design processes with Indigenous communities to enhance fit of the intervention to culture and community, to enable self-determination, and to encourage holistic thinking to increase the effectiveness and sustainability of the intervention (Oetzel et al., 2017).

Participants also want to be able to adapt the intervention during the community-engagement process. Adaptability is a common focus in implementation science with the expectation that adaption of the form is needed to enhance cultural/community fit and increase ownership, while protecting the core functions of the interventions (Damschroder et al., 2009; Kirk et al., 2020; Power et al., 2019). The Model for Adaption Design and Impact suggests that three domains of adaption are important: adaptation to the intervention, the adaptation process, and adaptation outcomes. Participants in the current study emphasised the first two domains although they felt that outcomes would be enhanced as a resulted.

Participants also identified several barriers related to funding and structural resources, consistent with the inner and outer settings of the CFIR (Damschroder et al., 2009). The funders of health organisations in New Zealand are primarily government based and the implications relevant to this study are the requirements organisations must meet to be eligible for funding. Strict funding constraints limits the organisation's ability to adapt an EBI, which participants in this study perceived to limit effectiveness of the intervention and lower the likelihood of adopting it. Further, participants noted that it is important for organisations to consider if they have the capacity (staff and infrastructure) to adopt the intervention as many lose staff when funding is cut or stops (Wandersman et al, 2008).

A limitation of this study is that there was a heavy focus on those receiving the intervention rather than those who created it. Therefore, the experiences described in this study are reflective of the end-users perspective. Further, snowball sampling may have introduced a bias in that "like-minded" participants were included and may have limited access to different implementation perspectives. Another limitation is the use of phone and online interviews. Many interviews had to be conducted with minimal to no physical contact due to the restrictions of COVID-19. However, these interviews were still conducted in a similar manner as the face-to-face interviews (same interview transcript and procedures). Finally, future studies should focus on the sustainability of implementing health interventions designed by others. These studies should aim to discuss how organisations can move away from traditional funding avenues in persuit of finding more sustainable options for their programmes.

In conclusion, this study has implications for the field of implementation science as it addresses key facilitators and barriers of adopting and adapting health interventions created by another organisation, even one that is from the same cultural group as the population it aims to serve. This study highlighted the importance of community engagement and adaptability of the EBI to enhance fit to the community, while also use the programme structure and creator experience as core functions for the EBI. Further, the study identified nuanced aspects of funding and resources for organisations that constrain organisations in employing health interventions designed by others. These facilitators and barriers provide important insights for Indigenous implementation science as framed by the Consolidated Framework for Implementation Research.

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Appendix 1: Demographics

Table 2. Demographic information of participants

	Ethnicity	**Gender**	**Organisation Type**	**Position**
Danielle	Māori	Female	Māori Health Provider	General Manager
Hone	Māori	Male	Māori Health Provider	CEO
Pearl	Māori	Female	Charitable Trust	CEO
Jane	Māori	Female	Primary Health Care Providers	General Manager
Michelle	Non-Māori	Female	Age Care Provider	Director
Tamati	Māori	Male	Primary Care Services	General Manager
Yvette	Non-Māori	Female	Māori Health Provider	General Manager
Tash	Māori	Female	Māori Health Provider	General Manager
Peter	Māori	Male	Māori Health Provider	CEO
Tane	Māori	Male	Māori Health Provider	CEO
Karen	Non-Māori	Female	Age Care Provider	Community Health Worker
Tracey	Māori	Female	Māori Health Provider	Community Health Worker
Linda	Non-Māori	Female	Charitable Trust	Advisor
Mary	Māori	Female	Māori Health Unit	Community Health Worker
Clint	Non-Māori	Male	Māori Health Unit	General Manager
Josephine	Māori	Female	Māori Health Provider	General Manager
Emma	Māori	Female	Māori Health Provider	Clinic Manager

Appendix 2: Interview Guide

Interview Guide

1.   Ice-breaker questions

Let's begin with [provider name]. What does it do/who does it serve/how many work there etc?
- What health and social services does [provider] offer? What does [provider] want for its health and social service programmes? What is your role?

2.   Perceptions/ previous experience

-What experience do you [provider] have in implementing health and social service programmes developed by others (e.g., MOH, MSD)

-What was the programme?

-What funding was offered to do this?

-What happened after the funding stopped?

 -[If funding stopped] What made it possible for the programme to work beyond the funding period?

-What made it possible to put the programme into practice? (Probes: e.g., resources, skills, training, support, commitment. Also, seek out organizational factors such as internal processes and external constraints, and issues of trust in relation to who developed the project etc.)

-What made it possible for the programme to work when people left [provider]

3.   Perceived/experienced benefits and challenges

-What were / are the potential benefits of using a programme that has had positive impacts, and been developed by someone one else/another organisation?

Probes: funder imposed progamme to Māori provider/s? one Māori service provider to another; Māori service provider to a non-Māori provider

-What were / are the potential challenges or disadvantages of using a programme that has been developed by someone one else/another organisation?

-What do you see the challenges and opportunities may be/are for making the intervention bigger or smaller?

4.   The KMM programme

-What do you think you /[provider] would need to in place to adopt/adapt or use this programme for kaumātua in your area? (e.g., resources, skills, training, support, commitment; organizational factors such as internal processes and external constraints, and issues of trust in relation to who developed the project etc.)

-What factors would make it easy for you /[provider] to adopt/adapt/ use this programme in your community or in other communities?

-What do you think the potential barriers/challenges would be to adopting/adapting/using this programme in your community or in other communities?

Probe: In addition to money, what else would you need to facilitate [provider] to adopt/adapt/ use the programme?

-In your area/ [provider] would you see the programme as being bigger, smaller, or about the same?

Probe: What makes you say this? Reasons?

-What kinds of support would you like to have (from the original project) to support you/ [provider] to adopt/adapt/ use the programme? (e.g., resources, training, other support, …)

5.   Closing

-What questions would you like to ask me?

-What else would you like to say?

Chapter 6 – Implementation effectiveness of health interventions with Māori communities: A cross-sectional survey of health professional perspectives

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6.1 Abstract

Objective: To identify factors that New Zealand health professionals rate as important for implementation effectiveness for health interventions with Māori communities.

Methods: Health professionals (N=200) participated in an online cross-sectional survey. The survey was organised in three sections: a) participants' general perceptions of key features for implementation effectiveness; b) participants' direct experience of implementing health interventions with Māori communities, and c) general demographic information.

Results: Paired sample t-tests revealed four levels of importance for implementation effectiveness with teamwork and community autonomy as most important. Only 24% of participants had prior experience with a previous health intervention with Māori communities. A multiple regression model identified two key overall factors that were associated with participants' rating of implementation effectiveness in these previous interventions: process (B=.29 p<.01), and community (B=.14, p<.05).

Conclusions: Key areas of implementation effectiveness are community engagement and participatory process and contributes to the body of literature that challenges traditional top-down approaches of implementation.

Implications for public health: This study provides the perspectives of health professionals on implementation effectiveness when working with Māori/Indigenous communities. These professionals often lead implementation of health interventions to address health equity. The study supports the inclusion of community voice in implementing community health interventions.

6.2 Background

Research in Aotearoa New Zealand continues to identify significant health inequities between Māori (Indigenous people of New Zealand) and non-Māori populations (Grey et al., 2018; Ministry of Health, 2015). These inequities stem from a range of factors including social determinants, racism, cultural insensitivity, and the inability of some health professionals to connect with their patients as well as the lack of commitment in the past by the New Zealand

Government towards obligations under Te Tiriti o Waitangi (The Treaty of Waitangi[3]; the founding document for New Zealand that outlined the relationships between Māori and non-Māori colonisers) (Nuku, 2013). Many of these structural barriers influence the implementation of the health services such as not always having culturally appropriate practices for Māori, cultural training for health professionals, and some patients lacking financial resources which may affect the attendance at health appointments (Nuku, 2013).

Numerous health interventions have been developed in recent years to address these inequities with an aim of addressing structural issues within a culturally-centred approach (Ni Mhurchu et al., 2019; Oetzel et al., 2020; Selak et al., 2018). Some of these interventions have been developed through a Kaupapa Māori lens (methodology centred in Māori knowledge and cultural practices [or tikanga] developed by and with Māori) and with participatory, co-design methods to enhance the cultural centeredness of the interventions (Oetzel et al., 2017; Nuku, 2013). While many of these interventions have been shown to have efficacy, the majority of them have not considered larger issues of implementation effectiveness.

When implementing health interventions with Indigenous communities there is always concern regarding the reception of the health intervention. Mainstream implementation focusses on the individuals' ability to adopt the intervention (Haider & Kreps, 2004; Nilsen, 2015). Indigenous implementation often has a community approach in which it encourages implementation within a collective setting--focussing on the entire community rather than one individual (Harding & Oetzel, 2019). This inclusive process relies heavily on the health professionals' ability to complement the community's approach and create goals that the community and the health professional collectively identify as a priority (Wallerstein et al., 2018).

Research identifying factors that are associated with implementation effectiveness of health interventions includes five categories: the intervention, the process of creating the intervention, the organisation(s) implementing the intervention, the communities for which the intervention is intended, and the individuals who are involved in the implementation of the intervention (Harmsen et al., 2005). The intervention includes different aspects of the intervention itself that will be implemented such as the innovativeness of the intervention, the

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[3] The authors recognise that Te Tiriti o Waitangi and The Treaty of Waitangi are two different documents. The document of reference in this case is Te Tiriti o Waitangi and are only providing a direct translation of the treaty for the wider International audience.

compatibility of the intervention with the person or community and the relative advantage of the intervention (Meyer et al., 1997; Nilsen, 2015).

The process of creating the intervention is the second factor and it is just as important as the intervention itself (Rogers, 2003). Process focuses on the methods or approach used to develop and implement the intervention. There is an increasing body of research that has found that health interventions developed and implemented through participatory or collaborative processes (e.g., community-based participatory research) are strongly associated with improved health outcomes and reduced inequities (Oetzel et al., 2017; Oritz et al., 2020). For example, an implementation framework targeted for Māori suggests that key elements of the development and implementation of the intervention include community engagement (e.g., shared decision making), culture centeredness (e.g., community voice in defining the problem and creating the intervention), systems thinking (e.g., focus on holism and how the intervention will fit within a system), and integrated knowledge translation (e.g., inclusion of end users in the development process) (Oetzel et al., 2017). Research suggests that process is among the least likely to be assessed during the implementation of a health intervention (Chaudoir et al., 2013).

The organisation is the third factor for implementation effectiveness. The organisation is the entity(ies) responsible for the implementation of the intervention (Chaudoir et al., 2013). Research suggests that several organisational elements are associated with intervention effectiveness including the support of management for the change and having effective teamwork amongst people implementing the intervention (Shortell et al., 2004).

Community is an oft-studied element in the development of an intervention although not always considered for implementation effectiveness (Chaudoir et al., 2013). Key community elements include the readiness to change, community autonomy to participate and define problems and prior history of intervention work (Wallerstein et al., 2018). Health researchers often use participatory processes to gauge community readiness and fit and ensure the methodological principles of the health intervention align with the participants' identity (Huria et al., 2014). While community is often linked with a process, it is also a distinct element that centres on the context of the implementation (Wallerstein et al., 2018).

The final element is the characteristics of the individuals who are delivering the intervention. Some of the key individual characteristics include self-efficacy and work-related

knowledge which are positive correlates for effective implementation of new interventions (Sarma et al., 2020). An individual's belief in their own ability to perform and produce an acceptable level of output is referred to as self-efficacy (Sarma et al., 2020). Work-related knowledge helps the individual to perform better in their tasks as it equips them with sufficient knowledge about what is required of them (Sarma et al., 2020).

Improving the effectiveness of community health interventions rely increasingly on the ability of the health professional to identify key components of the implementation process that are effective and contribute to sustainable outcomes for whom the intervention is intended for (Steckler et al., 2002). Further, health professionals are the key deliverers of the intervention for the population. For example, research suggests that in working with Māori communities, cultural competency and communication skills for health professionals are key to successful health outcomes and stronger relationships with patients (Huria et al., 2014; Pitama et al., 2014).

There is research about facilitators and barriers for implementation for health interventions (Chaudoir et al., 2013; King et al., 2018). However, the perspectives of health professionals about implementation effectiveness of health interventions for Māori is under researched. Articles on health professional perspectives tend to be commentary or reflection about implementation of a particular intervention (Blundell et al., 2010). It is important to include health professional perspectives as they are the frontline individuals who are carrying out the tasks of implementing the interventions. Therefore, the purpose of this study was to identify the perspectives from New Zealand health professionals about implementation effectiveness for Māori communities. The research questions for this study were:

1. How do New Zealand health professionals rate the importance of features of implementation effectiveness of health interventions with Māori communities?
    a. Is there variability in the ratings based on demographics and prior experience with health interventions?
2. What features are correlated with implementation effectiveness of the health interventions implemented with Māori communities?

6.3   Methods

6.3.1   Methodology

This study was guided by Kaupapa Māori methodology as its main goal is to ensure the research conducted has positive outcomes for Māori communities (Smith, 2000). Kaupapa Māori research prioritises Māori worldviews and tikanga (protocols) in investigating research topics that are of importance for Māori communities; in this case implementation effectiveness for health equity. The study builds on a programme of research about Māori implementation science led by a Māori researcher (Harding et al., 2020). Specifically, the focus of the prior research was on understanding implementation effectiveness from a Māori perspective. The current research employed Kaupapa Māori throughout the study, in particular, in the selection of questions and in the interpretation of the results. The questions were selected as informed by this previous research programme and from the extant literature that is consistent with prior implementation science literature, particularly that which is based on Kaupapa Māori methodology (Oetzel et al., 2017). The interpretation of the results was centred on addressing implementation effectiveness and health equity to benefit Māori communities and from a Māori perspective. Both authors have previously worked with Kaupapa Māori methodology and value the framing it brings to this study.

6.3.2   Research Design and Sampling Frame

The research design for this study was a cross sectional survey. We employed Qualtrics to administer the survey. Studies have employed Qualtrics and highlight their effectiveness in data collection such as easy access, diversity of participants, volunteerism, and anonymity while also ensuring data quality (Holt & Loraas, 2019). The sampling frame was a panel of healthcare workers in New Zealand maintained by an online partner provider of Qualtrics. The panel consists of nearly 4,600 from all facets of the healthcare workforce. The inclusion criteria or profile attributes that Qualtrics was provided with included: medicine/nursing, community health, health management and related functions, allied health, and support workers. The panel providers undergo a thorough and strict process during recruitment and they classify panel members during this process including an established system for verification and security. Members choose to join a panel through a registration process. Upon registration, they enter some basic data about themselves, including demographic information, hobbies, interests, among many other characteristics that are used to match panelists to specific surveys (i.e., not

all panelists are invited to every survey) (Joanne Dufficy, project coordinator, e-mail communication 10 March 2020).

6.3.3 Measures

The items for the survey are included in Supplementary File 1 and were organised in three sections. Before beginning the survey a screening question determined whether participants had experience working with Māori patients or communities. Responding no removed the participant from the survey. The first section of the survey focussed on the participants' general perceptions of five factors for effectively implementing health interventions with Māori communities. The response scale for the first section was from not at all important (1) to extremely important (5). The first factor was based on the characteristics of the intervention and included 10 items slightly adapted from various sources (Pankratz et al., 2002; Peters et al., 2002) and one item created for this study. The second factor was process and included eight items from two sources (Duckers et al., 2008; Wallerstein et al., 2020) and three items created for this study. The third factor was organisation and included 10 items from various sources (Duckers et al., 2008; Hutchinson & Johnston, 2004; Shea et al., 2014; Wallerstein et al., 2020) and one item created for this study. The fourth factor was community with three items from a previous source (Wallerstein et al., 2020) and three items were created for this study. The final factor was the individual and included nine items adapted from various sources (Goh & Richards, 1997; McCormack et al., 2009; Upton & Upton, 2006; Wallerstein et al., 2020), with one item that was created for this study. While most of the items came from previously used sources, the collection of items do not have previous reliability and validity estimates. Thus, these psychometric properties are addressed directly in this study. This section of the survey highlights the participants' perceptions of implementation effectiveness when working with Māori communities.

The second section of the survey focussed on participants' direct experience of implementing health interventions with Māori communities. The section began with a question as to whether respondents had experience with a previous health intervention with Māori communities. If they responded no, they continued to the third section. With a yes, they were then asked about their role on the project and then completed questions about the implementation and its effectiveness. The response scale for these items were from a small extent (1) to a complete extent (5). For intervention, two items were created for the study, and one item was adapted from another source (Peters et al., 2002). For process, all three items

were adapted from a previous source (Wallerstein et al., 2020). For organisation, three items were adapted from two sources (Goh & Richards, 1997; Wallerstein et al., 2020). For community, both items were created for this study. For individual, three items were adapted from three sources (Hutchinson & Johnston, 2004; Melnyk & Fineout-Overholt, 2011; Wallerstein et al., 2020). Additionally, implementation effectiveness was measured by five items from two sources (Hutchinson & Johnston, 2004; Wallerstein et al., 2020) and two items created for the study. This section highlights the number of participants who have direct experience of working on novel health interventions with Māori communities and enables this study to compare perceptions of implementation effectiveness with those who do not. Finally, the third section of the survey consist of generic demographic items.

6.3.4 Recruitment and Data Collection

Recruitment and data collection was conducted by Qualtrics. Qualtrics randomly selected respondents who matched the inclusion criteria and sent an e-mail invitation. To those that were previously invited, but did not start or dropped out of the survey, a reminder e-mail was sent. Participants received an incentive for their participation in the form of points. The points system is set up by Qualtrics where points can be accumulated and redeemed in the form of gift cards, airline miles, credit for online games, etc. The amount of points differed depending on factors such as the target audience and the length of survey. The length of the survey differed for those who had experience with prior interventions, they had extra questions to answer. All respondents received the same incentive allocated by Qualtrics. The research ethical procedures for this study were approved by the Human Research Ethics Committee at The University of Waikato (HREC2019#87).

6.3.5 Data analysis

Factorial validity for the items in the five factors was established using a principal component factor analysis and varimax rotation. Factors with eigenvalue greater than one were retained; items with primary loading of at least .6 and secondary loading .2 less than primary were retained. Internal consistency (Cronbach's alpha) for items was checked within each factor. Independent sample t-tests compared respondents with direct experience to those without on each factor; demographic questions were compared with oneway ANOVA. Also, paired sample t-tests compared the ranking of the factors. For the second research question, the internal consistency of the items within each factor was calculated. One item in the community

factor was removed to obtain an acceptable Cronbach's alpha. The implementation effectiveness measure had some missing data which was replaced with series mean prior to analysis. This occurred because some items were not relevant and was a way to retain an equivalent outcome score to other participants. The implementation effectiveness scale was regressed on the five factors using multiple linear regression and a forward procedure.

6.4   Results

Of the total invitations sent, 59% refused to start the survey for an approximate response rate of 41%. Qualtrics removes surveys based on quality checks such as response patterns, time to completion, and fraudulent respondents. Of the 307 participants who entered the survey, 96 were removed due to insufficient data. Of those 96 responses, 63 did not complete the survey, 31 opted out of taking part in the survey, and 2 people did not have any experience in their roles working with Māori communities. A further 11 people who completed the survey were deemed to be low quality (patterned missing data or completed the survey too quickly). As a result, 200 survey responses were deemed as having sufficient data for analysis for this study. A total of 48 people had direct experiences with implementing health interventions with Māori communities. Table 1 presents a summary of the demographic characteristics of the study sample.

Chapter 6 - Table 1: Demographic Characteristics

Variable	Attribute	Sample (N=200)	Prior Intervention Experience (N=48)
Gender Identity	Male	23.5%	31.3%
	Female	76.0%	66.7%
	Different	0.5%	2.1%
Ethnicity	NZ or other European	70.0%	43.8%
	Māori	7.5%	10.4%
	Samoan	1.5%	2.1%
	Cook Islands Māori	0.5%	-
	Tongan	0.5%	2.1%
	Niuean	0.5%	2.1%
	Chinese	5.0%	4.2%
	Indian	5.5%	10.4%
	Other	18.5%	18.8%
Education	Less than High School	0.5%	2.1%
	High School/College	13.0%	14.6%
	Undergraduate Qualification	45.5%	29.2%
	Postgraduate Qualification	38.5%	54.2%
	Other	2.0%	-

Job title	Clinician (doctor/nurse)	38.0%	41.7%
	Community Health Worker	19.0%	16.7%
	Allied Health Professional	23.0%	22.9%
	Other including health management	20.0%	18.8%
Role in intervention	Deliverer/Care Provider	-	62.5%
	Evaluator	-	8.3%
	Co-creator	-	25.0%
	Manager/Supervisor	-	20.8%
	Cultural Advisor	-	6.3%
	Advisory Board Member	-	6.3%
	Principal Investigator	-	2.1%
	Other	-	6.3%
Age: M (SD)		43.10 (14.2)	44.17 (13.6)

Note: For ethnicity and role in intervention, participants could select more than one category so numbers do not add to 100

Prior to addressing the primary research questions, the items for the five main implementation categories were subjected to factor analysis (see Supplemental File 1 for results). The 11 items from intervention resulted in three factors accounting for 67.40% of the variance. These factors were identified as community ($\propto$=.84), novelty ($\propto$=.60), and evidence based ($\propto$=.59). *Community* refers to the alignment or fit of the health intervention to the communities' needs; *novelty* is that the health intervention is new or different to what is currently being done in the field; and *evidence-based* refers to fact that the health intervention is informed and supported by research evidence. The 11 process items resulted in a single factor accounting for 56.02% of the variance named process ($\propto$=.92). The 11 items in organisation resulted in two factors accounting for 70.77% of the variance: teamwork ($\propto$=.87), and management ($\propto$=.86). *Teamwork* refer to the importance of everyone in the organisation working collaboratively to effectively implement the health intervention, and *management* refers to the support of management staff and their involvement in the decision making for the health intervention. Four of the items were removed due to not loading cleanly on either factor. The factor analysis of the six community items resulted in two factors accounting for 78.93% of the variance: community autonomy ($\propto$=.88), and prior history ($\propto$=.84). *Community autonomy* is the inclusion of community voice and decision making in the health intervention and *prior history* is the experiences the communities may have had in past interventions or health projects. Finally, the 10 individual items resulted in two factors accounting for 60.14% of the variance: self-efficacy ($\propto$=.84), and work-related knowledge ($\propto$=.80). *Self-efficacy*

refers to beliefs that the individuals involved in the implementation are capable and confident in their ability to carry out their tasks, while *work-related knowledge* highlights knowledge and experience in implementing health interventions. Three items were removed because the items did not load cleanly on either of the two factors. Table 2 provides the descriptive statistics for the resulting variables from the factor analysis.

To address the first research question, paired sample t-tests were used to identify which of the implementation variables were identified as most important for implementation effectiveness in Māori communities. Four levels of importance were identified. The most important items were teamwork and community autonomy with both having means above four on the five-point scale. The next level of importance included community fit, self-efficacy, and process with means right around four. The third level of importance comprised of management and evidence-based with means in the upper three range. The final level included work-related knowledge, prior history and novelty with means in the lower threes.

Table 2 also presents the findings for comparisons of ratings of implementation variables between participants who had experience in implementing health interventions with Māori communities and those who did not. Overall, people with prior experience rated all the variables as more important than those without experience although only seven of the variables were statistically different. The only variables not showing a significant difference were teamwork, community fit and evidence-based.

We also examined demographic comparisons and found minimal differences. When comparing work positions novelty was the only variable with statistical significance: community health workers (M=3.55, SD=.73) rated novelty higher than clinicians (M=3.05, SD=.78, p=.016) and other health professionals (M=2.99, SD=.79, p=.014). Novelty was also the only statistically significant variable for education: high school graduates (M=3.50, SD=.70) rated it higher than undergraduate qualification (M=3.06, SD=.79, p=.021). Furthermore, evidence-based was the only variable that was statistically significant for the comparison of NZ European (M=3.85, SD=.76) and other ethnicities (M=3.61, SD=.73, p=.035).

Chapter 6 - Table 2: Differences in Ratings of Implementation Variables and Descriptive Statistics of Implementation Variables

	No Previous Experience		Previous Experience		Total		
	M	SD	M	SD	M	SD	95% CI
Most Important							
Teamwork	4.17	.79	4.32	.77	4.21[a]	.79	4.10, 4.31
Community Autonomy	4.07[1]	.82	4.35[2]	.70	4.14[a,b]	.80	4.02, 4.25
Very High Importance							
Community Fit	4.01	.70	4.20	.58	4.06[b]	.67	3.96, 4.15
Self-Efficacy	3.93[1]	.71	4.17[2]	.52	3.99[b]	.67	3.90, 4.08
Process	3.93[1]	.67	4.16[2]	.63	3.98[b]	.66	3.89, 4.08
High Importance							
Management	3.78[1]	.83	4.11[2]	.65	3.86[c]	.80	3.75, 3.97
Evidence-Based	3.76	.75	3.78	.78	3.77[c]	.76	3.66, 3.87
Moderate Importance							
Work-related Knowledge	3.30[1]	.91	3.63[2]	.96	3.38[d]	.93	3.25, 3.50
Prior History	3.16[1]	.87	3.46[2]	.97	3.23[d,e]	.90	3.11, 3.36
Novelty	3.06[1]	.73	3.50[2]	.86	3.17[e]	.78	3.06, 3.28

Note: Different number subscripts indicates statistically significant at $p < .05$ and compare previous experience to lack of experience; Different letter subscripts indicate statistically significant at $p < .01$ and compare implementation variables

To address the second research question, Table 3 displays a correlation matrix and descriptive statistics for the variables in the second section of the survey. The multiple regression model of implementation variables was statistically significant, $F(2,45)=12.48$, $p<.001$, adj $R^2=.33$. While all five factors had significant and positive bivariate correlations with implementation effectiveness, the regression model found two statistically significant predictors of intervention effectiveness = process (B=.29, SE=.10, Beta=.38, $p<.01$), and community (B=.14, SE=.06, Beta=.32, $p<.05$).

Chapter 6 - Table 3: Correlation Matrix of Implementation Variables and Outcomes for those with Previous Intervention Experience

Variable	M	SD	1	2	3	4	5	6
1. Intervention	3.51	0.83	.81					
2. Process	3.31	1.00	.79**	.79				
3. Organisation	3.52	0.97	.53**	.57**	.79			
4. Community	4.65	1.68	.33*	.46**	.65**	.86		
5. Individual	3.62	0.85	.66**	.61**	.58**	.38**	.81	
6. Outcome	3.58	0.37	.49**	.53**	.45**	.49**	.38**	.82

Notes: Cronbach's alpha listed on the diagonal; **p<.01; *p<.05

6.5 Discussion

This study aimed to identify the key features that New Zealand health professionals perceive as important for implementing health interventions when working with Māori communities. Additionally, this study sought to identify the features that health professionals with implementation experience believe predict outcomes of health interventions with Māori communities.

6.5.1 Key Implementation Features

Participants in this study identified effective teamwork in the organisation and community autonomy as the most important features for implementation effectiveness. The second tier of factors included community fit, process and self-efficacy. These findings are consistent with some of the existing literature on the importance of effective teamwork and self-efficacy of individuals (Shortell et al., 2004). They also are consistent with the growing literature about the importance of community engagement and participatory processes when implementing new interventions (Oetzel et al., 2017; Wallerstein et al., 2018). Community autonomy, however, is not often considered a priority in implementation effectiveness (Chaudoir et al., 2013), but speaks to the importance of communities being able to determine what interventions are right for them (Oetzel et al., 2017). Self-determination is a key aspect of Te Tiriti o Waitangi when working with Māori communities and this finding likely reflects this contextual element (Nuku, 2013).

The least important features in this study were work-related knowledge, prior history and intervention novelty. Individual work-related knowledge and community prior history are moderately ranked perhaps suggesting prior knowledge and experience is not a pre-requisite for developing an intervention; they may be seen as helpful elements by some, but overall other elements of the process and community are the necessary elements for implementation effectiveness (Oetzel et al., 2017). Further, novelty was the lowest ranked feature and may reflect that trying something new in and of itself is not a key element for success. Rather, it may be that some action or effort including tried and tested interventions may be important to address a need rather than a novel health intervention (Baumann et al., 2006).

There were only minor differences in the rankings for demographic characteristics except for previous experience. Those professionals with previous experience ranked most of the implementation variables higher than those without experience which likely speaks to the fact that experience with implementation creates an awareness into the complexity and difficulty in effectively implementing a new intervention (Nilsen, 2015). Thus, those without experience likely will benefit from mentorship from health professionals without experience.

6.5.2 Correlates of Implementation Effectiveness

This study found that health professionals perceive all factors (the intervention, process, organisation, community, and individual) are positively correlated with implementation effectiveness in previous health interventions implemented with Māori communities. However, process and the community involvement in the implementation of the intervention were the significant correlates of intervention effectiveness within a multiple regression model. These are the areas that are less likely to be considered in the implementation science literature (Chaudoir et al., 2013), and yet consistent with the growing literature about participatory processes in working with communities (Ortiz et al., 2020). Participatory processes engage community members to discuss their views and goals regarding the health intervention and collectively work towards a solution (Huria et al., 2014).

The study findings reinforce a growing trend in New Zealand toward co-design and collaboration with communities in health research, health interventions and health services (Oetzel et al., 2017). The larger extant literature has emphasised the importance of co-creating health interventions with Māori and other Indigenous communities as critical for improving health and reducing health inequities (Wallerstein et al., 2018). The current study illustrates that New Zealand health professionals recognise the importance of prioritising the process and community involvement as well. However, challenges remain including limited funding for translating research into implementation practice and health systems focused on traditional implementation models (i.e., top-down driven approaches). Perhaps not unrelated to this last claim is that only 24% of participants had experience working on a health intervention with Māori communities.

While the limited number of participants with direct experience working on a health intervention is surprising, these findings still have important implications for implementation effectiveness for health intervention for Māori communities. Their perspectives matter because

they are front line workers who are likely to implement novel and established evidence-based interventions. Even if they do not have direct experience, they are likely to have an opportunity in the future and also can reflect on their own clinical practice as to what features matter for implementation effectiveness. These perspectives will shape the implementation process and thus understanding the degree to which their perspectives align with Kaupapa Māori and Māori implementation science are important (Harding & Oetzel, 2020; Oetzel et al., 2017; Smith, 2000). Collectively, the participants have consistent patterns in emphasising implementation processes and community fit and autonomy that are consistent with Kaupapa Māori. Thus, a key implication is that health professionals want to follow Kaupapa Māori principles as they think it will enhance implementation effectiveness. To the extent these are not followed are likely to be related to systemic and structural issues in funding at a district health board or ministry level which is beyond the scope of the current study.

6.5.3 Limitations

While this study was important for providing health professional perspectives about implementation effectiveness, there are several limitations as well. A first limitation for this study is that the cross-sectional nature of the study does not allow us to make causal links between implementation factors and effectiveness. A second key limitation was that we do not know how representative the Qualtrics panel is and thus the external validity of the findings is questionable. There limited details regarding the characteristics of those who chose not to participate in the study. We can assume they match those of the participants who did respond based on Qualtrics sampling frame but we cannot be certain. Another limitation for this study was the sample size given the small proportion of professionals with prior implementation experience. While the multiple regression model has the minimum number of participants for the number of regressors in the model, a larger sample may have provided greater variability in responses. A further limitation is the lack of items regarding the impact of funding models and system structures and the impact they have on implementation effectiveness. The final limitation is that two of the subscales had relatively low internal consistency estimates although the vast majority had strong estimates (i.e., at or near .80 or above). Despite this limitation, most of the psychometric evidence supported the reliability and validity of the scales and thus these can be used by other studies to measure implementation factors. These scales can help supplement existing measures (Chaudoir et al., 2013) particularly around issues of community and process.

6.5.4 Conclusion

In conclusion, this study aimed to provide the perspectives of health professionals about implementation effectiveness of health interventions for Māori communities. Health professionals are the frontline individuals who deliver the interventions and this study provides their perceptions within the New Zealand context. This study identified that the most important features for implementing health interventions with Māori communities from a health professionals' perspective related to the process by which the intervention was developed, engagement with the community including community autonomy, and effective teamwork. This study has highlighted key areas of implementation that are not always discussed or considered and contributes to the body of literature that challenges the traditional top-down approach.

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Appendices

Appendix 1: Supplement File 1. Survey Items

Section 1: Factor Analysis of Items in Section 1

Table 1. Intervention Items

#	Item	1 Community Fit ($\propto$=.84)	2 Novelty ($\propto$=.60)	3 Evidence Based ($\propto$=.59)
1.1	The new intervention is better than what already exists or fills a void where nothing exists [25]	.296	-.085	.761
1.2	The intervention is consistent with tikanga (customs) of Māori communities [26]	.698	-.007	.290
1.3	There is research and evidence supporting the effectiveness of the intervention from international studies [34]	.148	.193	.816
1.4	The intervention is used by other organisations and opinion leaders that are respected [25]	.196	.689	.479
1.5	The intervention has never been used before *	-.101	.856	-.082
1.6	The intervention can be adapted to fit the needs of the organisation and the community [25]	.683	.020	.390
1.7	The intervention is compatible with the organisation's culture [26]	.840	.163	-.014
1.8	The intervention challenges the current workflow of the organisation to make changes [26]	.374	.682	.051
1.9	The intervention is consistent with the values and principles of the community [25]	.826	.074	.194
1.10	There is evidence-based practice results from Māori communities [34]	.650	.341	.232

Table 1. Process Items

Item		1 Process ($\propto$=.92)
2.1	The implementation goals are widely understood and supported by the team [27]	.728

2.2	The team has diverse membership to work effectively on the implementation [27]	.738
2.3	The team evaluates together what they do well and how to improve on collaboration [27]	.792
2.4	The intervention is the result of shared decision making amongst community and organisation partners *	.828
2.5	At meetings with external stakeholders, the organisation works collaboratively with all members [28]	.795
2.6	Relevant external stakeholders have been included in the development of the intervention [27]	.777
2.7	External stakeholders set high expectations about performance and improvement potential [28]	.633
2.8	Participating in implementing the health intervention helps the team to see the complexity of the issue [27]	.787
2.9	The intervention targets changes at multiple levels in the community [27]	.719
2.10	The intervention targets system changes and not just individual behaviour *	.721
2.11	The intervention considers social determinants of health *	.694

Table 3. Organisation Items

Item		1 Teamwork (∝=.87)	2 Management (∝=.86)
3.1	The intervention is important to the organisation's management [28]	.200	.807
3.2	The organisation's management supports the intervention actively [28]	.436	.711
3.3	The board/managers provide stewardship of the activities of the project team [28]	.137	.854
3.4	The organisation emphasises what the community considers to be important to the health intervention (culture, environmental and social factors) [27]	.455	.686
3.5	The organisation is motivated to implement the health intervention [29]	.645	.562
3.6	The organisation is committed to implementing the health intervention [29]	.650	.577
3.7	The division of tasks in the team is perfectly clear [28]	.747	.325
3.8	Everyone in the team is doing what he or she should do [28]	.863	.244
3.9	There is good communication and coordination in the team [29]	.890	.159
3.10	The organisation is determined to implement the health intervention despite any challenges *	.610	.496
3.11	Enhancing managerial support and encouragement in the organisation of the implementation [30]	.452	.615

Table 4. Community Items

Item		1 **Community Autonomy** (∝=.88)	2 **Prior History** (∝=.84)
4.1	The community or communities participating in the intervention have a history of organising services or events [27]	.065	<u>.865</u>
4.2	The community or communities participating in the intervention have a history of advocating for health equity [27]	.323	<u>.801</u>
4.3	People in the community or communities participating in the intervention have previously influenced decisions that affected their communities [27]	.179	<u>.878</u>
4.4	The community or communities identify the intervention as addressing a key health need to the community *	<u>.850</u>	.232
4.5	The community or communities are committed to the implementation of the intervention *	<u>.923</u>	.167
4.6	The community or communities are open to working collaboratively with the organisation to implement the intervention *	<u>.871</u>	.135

Table 5. Individual Items

Item		1 **Self-efficacy** (∝=.84)	2 **Expertise** (∝=.80)
5.1	Individuals expressed their 'cultural' viewpoint in the development and implementation of the intervention (i.e. as Māori, Pākehā, other ethnicity) [27]	.349	.541
5.2	Individuals focus on innovative ideas rather than on how the organisation normally operates [31]	<u>.679</u>	.111
5.3	Individuals are able to contribute new ideas to the implementation rather than follow established protocols [32]	<u>.776</u>	.221
5.4	Individuals feel adequate in their role to fufill the implementation of the intervention [33]	<u>.769</u>	.286
5.5	Individuals are open to learning about different cultural perspectives [33]	<u>.740</u>	.237
5.6	Individuals can overcome barriers during the implementation process [31]	<u>.724</u>	.326
5.7	Individuals are experts in the topic of the intervention *	.301	<u>.676</u>

5.8	Individuals share the same perspectives as others in the team [30]	-.035	<u>.861</u>
5.9	Individuals actively engage in self-evaluation [32]	.515	.663
5.10	Individuals are reflexive about power and privilege [27]	.441	.616

Section 2: Items for Section 2

Table 6. Intervention Items

Item	
1	The intervention was better than what already existed *
2	The intervention was consitent with the tikanga (principles) and values of the community *
3	The intervention was consistent with the values and principles of the organisation [26]

Table 7. Process Items

Item	
1	The implementation was developed through shared decision making with the community [27]
2	Relevant external stakeholders were included in the development of the intervention [27]
3	The intervention targeted change at multiple levels [27]

Table 8. Organisation Items

Item	
1	The organisation was ready to implement the health intervention [27]
2	New health intervention ideas from employees were taken seriously by management [32]
3	Everyone invovled in the implementation of the health intervention worked collaboratively to achieve the project goal [27]

Table 9. Community Items

Item	
1	The community or communities were experienced in advocating for health equity *
2	The community was committed to the implementation of the intervention *

Table 10. Individual Items

Item	
1	Individuals who implemented the health intervention were confident in their ability to do so [34]
2	Individuals had fresh ideas for implementation of the health intervention [31]

3	Individuals were aware of different cultural perspectives during the implementation of the intervention [27]

Table 11. Outcome Items

Item	
1	Better co-ordination between health providers and community groups [27]
2	Improved the health of the community [27]
3	Improve the health behaviours of people who participated [27]
4	The intervention has continued after the initial funding period *
5	Improved availability and accessibility of health services [30]
6	The intervention was well received by the community *
7	I was satisfied with the implementation of the intervention [27]

*Item created for this study

Sources:

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Chapter 7 – Conclusion

The purpose of this thesis was to highlight the facilitators and barriers of implementing health interventions with Māori communities in New Zealand. The four studies comprising this thesis aimed to contribute to the conversation about reducing health inequities that Māori communities' face in New Zealand by enhancing implementation effectiveness. The goal of the four studies was to identify how facilitators and barriers can affect implementation effectiveness and to illustrate how implementation is a key element in addressing equity. In this concluding chapter, the first section summarises the key findings from each study. The second provides a synthesised discussion of the three significant themes for the entire thesis. The third section provides implications of the research including a table that synthesises Māori and Indigenous implementation science. The final section identifies the imitations of this research followed by a few reflections and concluding comments.

7.1 Key Findings from Each Study

Chapter Three identified how each of the four key elements of the HPW framework have been applied to health interventions involving Indigenous communities. Firstly, studies showed three different levels of the culture-centered approach: 1) including community voice in defining the problem and identifying the solution, 2) adapting the intervention to fit the community, and 3) making minor changes to the intervention with little to no input from the community. Secondly, the systematic review identified that community engagement was largely enacted through CPBR methods and that two-thirds of studies demonstrated high levels of engagement during the creation, adaption, implementation and evaluation of the intervention. Thirdly, systems thinking was reflected in three predominant patterns within the studies: 1) targeting community level behaviour (clear understanding of multiple causes and perspectives in system-level activities and had multi-level interventions), 2) targeting only individual-level behaviour with limited systems thinking (retrospective recognition of systems thinking), and 3) targeting individual-level behaviour including systems thinking in the design of the intervention. Finally, integrated knowledge transfer also was reflected in three predominant patterns: 1) demonstrating limited or no knowledge translation activities or engagement (e.g., consulting end users at the beginning to gain access to participants), 2) including end users through steering committees (integrating them into the design and implementation of the intervention), and 3) integrating community and organisational leaders

from design to implementation process and discussing how the intervention led to funding, structural or policy changes. These patterns are important to recognise as they likely are contributing factors to implementation effectiveness of Indigenous health interventions.

Chapter Four explored the facilitators and barriers of co-designing health interventions with Māori communities whilst also discussing the advantages and disadvantages of using the HPW framework. The facilitators of effective co-design were collaboration and community voice. Collaboration was identified as including all relevant parties in the development and implementation of the intervention with shared decision making and mutual influence on the project. Community voice ensures the mana (integrity) of the community is always intact and is at the forefront of the co-design process. Community voice facilitates good co-design practice and allows community leaders to become the bridge between implementers and community. The barriers identified were mismanaged expectations and research constraints. Mismanaged expectations highlighted how the researchers' and health professionals' interactions with the community can be a barrier when appropriate expectations are not clarified which creates false hope in the community. Research constraints emphasised how the nature of research (jargon and Māori vs. Western approaches) and the constraints of funding (length of contracts, who controls funding, abiding by funding guidelines) become barriers for effective co-design. The potential of HPW framework as a facilitator for a co-design approach was highlighted as it puts Māori knowledge at the forefront, provides implementation guidance and is multi-functional. However, improvements to the framework include more evidence of its effectiveness, clarification of jargon and improvements in the sustainability aspects of implementing health interventions with Māori communities.

Chapter Five identified the facilitators and barriers when disseminating health interventions designed by others. The four facilitators were community engagement, programme adaptability, programme structure and creators' experience. Community engagement highlighted building relationships with community members to ensure acceptance of the new intervention, creation of specific solutions, the enhancement of positive outcomes and intervention sustainability. Programme adaptability referenced the adaptation of the intervention to suit and reflect the community and cultural context. Programme structure discussed a well-established structure with reliable information for the community organisation that adopts the intervention. Creators' experience included the supporting resources for end users by codifying experiences and thus provide mentoring for the end users. The barriers

identified were funding access, funding constraints and structural resources. Funding access referred to receiving funding and length of time the programme is funded, while funding constraints included the restrictions of the funding once it is granted. Both become barriers for end users by limiting the outcomes of the intervention or excluding the community voice and adapting the programme. Lack of funding causes financial strain on the end users and the programme likely will not come to fruition or reach its full potential. The final barrier, structural resources, addressed the human and organisational resources that could be impacted to implement the intervention. The limitations in workforce and organisations capacity to run new interventions may prove to be overwhelming to run the programme effectively.

Finally, Chapter Six explored the perspectives of New Zealand health professionals and the features they believe are important for implementation effectiveness of health interventions with Māori communities. The most important features were teamwork in the organisation around the implementation and community autonomy in deciding whether to adopt the implementation. The next level of importance included the fit of the intervention to the community, individual self-efficacy for implementing the intervention and the process of implementation development (i.e., completed in a participatory manner). The third level of importance comprised of the support of management staff in the organisation and whether the intervention had a strong evidence base. The final level included individual work-related knowledge, community prior history in implementing interventions and the novelty of the intervention. Additionally, professionals with prior experience in implementing a health intervention for Māori communities rated all the features as more important than those without experience. Lastly, the study also considered the features that are correlated with intervention effectiveness and found the process of implementation and the community involvement were the most significant and positive correlates.

7.2   Key Research Themes

This section of this chapter synthesises the findings around four key themes for the overall thesis that highlight the facilitators and barriers of implementing health interventions with Indigenous communities. The first theme, sustainability and funding, discusses the implications of implementing sustainable health interventions and the impact of the funding that is tied to the intervention. The second theme, community self-determination, highlights the importance of adapting the health intervention to fit the community and increasing community autonomy in the implementation process. The third theme, capacity, presents the

elements that contribute to an organisation or individuals' capacity to implement a community health intervention effectively. The final theme, participatory processes, highlights the key methods employed when engaging with Indigenous communities to effectively implement health interventions.

To provide some context for the themes, the model that was provided in chapter one is displayed below. This model was developed to encompass key stages that must be considered when implementing health interventions with Māori communities to achieve health equity.

Figure 1: Māori Implementation Science Strategy
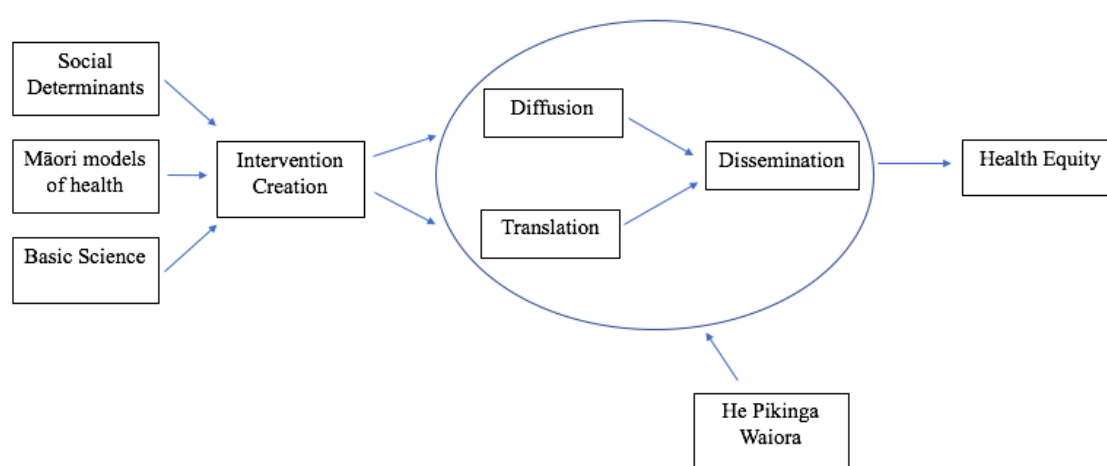
The themes that are discussed in this section are positioned in the HPW framework and have strong connections to the three key stages highlighted in the oval of this model. While the themes may mention other aspects in this model, they have specific implications for the diffusion, translation and dissemination of Māori and Indigenous health interventions. These themes challenge the traditional top-down approach and fosters community involvement and engagement in all stages of translating, diffusing, and disseminating health interventions. The inclusion of the HPW framework acknowledges the context of the interventions and demonstrates how including Māori communities in the implementation process can lead to better health outcomes which in turn leads to a strong likelihood of enhancing health equity.

7.2.1 Sustainability and Funding

Implementing sustainable interventions with Indigenous communities requires high levels of resources, and when funding is tied to contractual organisational obligations, it limits

community participation. This thesis identified that achieving sustainable interventions is heavily dependent on organisational resources and time. In Chapter Five lack of resources highlights the capacity an organisation has to sustain an Indigenous health intervention and the reality of maintaining those resources for a long period of time (Wandersman et al., 2008). It is important for organisations to consider if they have the capacity (staff and structure) to adopt the interventions as many face unexpected changes such as loss of staff, change in government (which may affect the organisation's funding), or change in leadership which may result in a lack of resources (Wandersman et al., 2008). This is a barrier as it changes the organisation's ability to commit to the intervention and affects the resources allocated to ensure implementation effectiveness. Furthermore, time affects the sustainability of an intervention as there must be an adequate amount of time allocated to allow the organisations to engage with their communities. Chapter Five identified that in doing so facilitates an environment where organisations and communities can co-create the intervention to fit the community needs (Wallerstein et al., 2018). Furthermore, Chapter Four supports this by identifying that co-creation of the intervention is crucial as it empowers communities and increases the sustainability of the implementation process (Smith, 2013). However, collaborative partnerships are logistically complex and take time to develop; if the implementation process has not allowed for such relationships to be established challenges and conflicts may arise (Wallerstein et al., 2018).

There are two aspects of funding that create challenges for implementation effectiveness: funding access and funding constraints. In this thesis, funding access was identified as the length of time the intervention was covered by allocated funding. Many participants from the studies in Chapter Four and Five spoke about the reality of having to scale down or dissolve their health interventions because funding was cut or they reached the end of their funding contract. Additionally, when time is of the essence the community voice is the first aspect removed from the implementation process to improve time efficiency and stick to a stringent funding schedule (Power et al., 2019). Chapter Five specifically highlights that funding access limits the sustainability of the health intervention by pressuring organisations to find financial support elsewhere, or lose the input of the community whose needs they are trying to serve (Power et al., 2019).

Funding constraints highlight the restrictions of the funding once it is granted. Chapter Four identified that the constraints of funding and mixing western and Indigenous perspectives

creates challenges to creating authentic co-design interventions (Durie, 2004; Wallerstein et al., 2018). Often the constraints are very specific milestones that funders require. However, those milestones may not be particularly relevant or helpful to the community the intervention is serving. This affects the way the intervention is created and implemented as organisations must abide by the funding criteria to continue to receive funding (Grimshaw et al., 2012). Funding constraints is a barrier as it has the authority to control how the intervention looks which may not be what the organisation and community had in mind; thus, removing the ability to have autonomy over the intervention and implementation process (as noted in Chapter Four and Five) (Grimshaw et al., 2012).

Research has emphasised the importance of co-creating sustainable health interventions with Māori and Indigenous communities as critical for improving health and reducing health inequities (Wallerstein et al., 2018). However, Chapter Three implied that sustainability is often overlooked in the implementation process resulting in Indigenous health interventions being discontinued after the funding period has ended (Grimshaw et al., 2012). This theme recognises the challenges that remain in limited funding for translating research into implementation practice and organisations and communities having the power to shape policy and provide resources to sustain interventions.

7.2.2 Community Self-determination

This theme highlights the agency, knowledge and perspectives of the community that are needed in implementing Indigenous health interventions. Community self-determination is a result of creating an environment that enables communities to adapt health interventions to fit the community's needs (Peterson, 2010). In doing so, it empowers the community to have autonomy and has implications to increase the effectiveness of the implementation process for all stakeholders involved (Peterson, 2010). Therefore, this theme has three key sub-themes that this thesis identified as contributing factors to community self-determination: intervention adaptability, community fit and community autonomy.

Chapter Three identified that adaption of interventions happens for many reasons: increased ownership, creating cultural fit for different population, lack of knowledge and lack of resources. This thesis highlights that it is crucial for the adaptation of the intervention to be led by those who will be receiving and implementing the intervention (Power et al., 2019). Chapter Five adds that by adapting the intervention to the community, it realigns the goals and

purpose of the intervention to the priorities of the community. Furthermore, participants shared that prior to accepting an intervention they wanted to ensure it could be adapted in order to reflect the community that would be receiving it. Adaptability ensures the intervention is able to be altered to reflect the community it is going to serve; culturally-adapted health interventions are more effective that traditional "top down" interventions (Delafield et al., 2016; Durie, 2004 Kaholokula et al., 2014;). By adapting the intervention it facilitates the implementation process as community members are more likely to adopt an intervention that is inclusive of their wants and needs (Wise et al., 2012).

Community fit speaks to the constant integration of the appropriate cultural values and practices into the translations, diffusion and dissemination of the implementation process (Huria et al., 2014). Chapter Five identified how community fit is integrated into the processes of adapting interventions which means including community and health organisation leaders in discussions regarding the creation, implementation and evaluation of the intervention. Chapter Four highlights community fit as a facilitating aspect for implementation science as it puts the community's ideas at the centre of the co-design process ensuring that the community is acknowledged at every stage of implementation. Furthermore, Chapter Three identified how community fit could impact how the intervention may challenge long-term implementation barriers such as funding, organisation structure or policy (Grimshaw et al., 2012).

Community autonomy in this thesis was identified as Indigenous communities being empowered by being included in the decision making regarding the implementation of the intervention. Traditionally, autonomy has not been handed to Indigenous communities, but rather demanded as an effort to decolonise the health policies of assimilation resulting from colonial histories (Durie, 2004). While community autonomy is not often considered a priority in implementation effectiveness in mainstream implementation science literature (Chaudoir et al., 2013), Chapter Six highlighted the importance of communities having some control in the process of designing a health intervention that fits their needs which is consistent with extent literature (Nuku, 2013). Chapter Three implied that building Indigenous autonomy and self-determination into the implementation process by advocating for a redistribution of power among external partners and changes in hierarchal structures.

Overall, this theme recognises that community self-determination is created through the inclusion of community needs that are reflected in the intervention. These subthemes contribute to community self-determination as they facilitate acceptability of interventions through

ensuring a sense of ownership, cultural relevance and centering of Indigenous knowledge to the health problem (Dutta, 2007; Mignone & Vargas, 2015, Power et al., 2019).

7.2.3 Capacity

This theme encompasses all the elements that affect an organisation's or individual's capacity to implement a health intervention effectively. Capacity highlights the importance of knowing what the organisation and individual is capable of before, during, and after the implementation of the intervention. This thesis has found that for the individual it is about their own self-efficacy and individual knowledge they bring to the implementation process. Furthermore, this theme considers implementing interventions designed by others where the creators experience and intervention structure play an integral role in building capacity in the organisation to carry out the implementation effectively.

Chapter Six identified that an individuals' capacity to participate in effective implementation processes can be attributed to their self-efficacy and work-related knowledge. For this thesis, self-efficacy refers to the belief that the individuals involved in the implementation are capable and confident in their ability to complete their tasks (Sarma et al., 2020). Work-related knowledge highlights the ability and experience individuals bring to their role in implementing the intervention (Sarma et al., 2020). These two factors are important for capacity as individuals' belief in their own skills to perform and the knowledge they have helps them perform better in their tasks and equips them with the sufficient knowledge about what is required. Furthermore, Chapter Three implies that an element of the HPW framework, systems thinking, offers an important opportunity for individuals to self-reflect on their capacity and evaluate their role and the impact it has had on the implementation effectiveness of the intervention (Midgley et al., 2007). Individual knowledge and self-efficacy have been identified in this thesis they were also only moderately ranked suggesting that they are not sufficient in and of themselves for implementing an intervention.

This theme also highlights the capacity an organisation has to implement an intervention effectively. Two key findings from this thesis that contribute to organisation capacity are the creator's experience and structure of the intervention. The creator's experience was identified in Chapter Five and is referred to as those who originally ran the programme and have personal experience with the intervention. From their experience they are able to provide knowledge and perspectives that are directly related to the effectiveness of

implementation for a specific intervention (Power et al., 2019). Participants in Chapter Five found this to be particularly helpful as the sharing of experiences could provide valuable information for the implementation process. Working with the original creators of the intervention becomes beneficial for those who are wanting to adopt the intervention as they have a direct link to those who can share what was and was not productive for implementation (Layne et al., 2008). Intervention structure also contributes to organisational capacity as it identifies a well-established format for the intervention to facilitate adoption. Participants from Chapter Five also shared that the intervention structure provided reliable information as to how the project had previously worked. The structure of the intervention was identified as a facilitator as it offers reliable and trustworthy information regarding the intervention .

Both creator's experience and intervention structure build capacity in the individual and the organisation as the individual benefits from the knowledge shared and the organisation benefits from facilitating processes identified by the original creators and a reliable structure. They provide evidence and reputable data to remove any concern end users may have about the relevance of the health intervention (Milat et al., 2015; Rogers, 2003). They reduce complexity and assist decision making by providing observable experiences to determine whether the intervention makes sense.

However, this thesis has noted that a barrier to individual and organisational capacity is the structural resources that are readily available or not. Chapter Five noted that participants were wary of the limits in their workforce and their own organisation's capacity when taking on a new health interventions. Without the additional resources required (such as training programmes or enough staff), those adopting the health intervention may lack the required capacity to do so (Wandersman et al., 2008). Regardless of the degree of individual and organisational motivation and support, an organisation must have sufficient resources in place to adopt and implement a health intervention effectively (Bach-Mortensen et al., 2018).

7.2.4 Participatory Processes

This thesis identified that participatory processes are becoming more popular when implementing health interventions with Indigenous communities. The key participatory processes of implementation science in this thesis are community engagement, community voice and organisational teams. These participatory facets become facilitators as they emphasise how the process of implementation is just as important as the intervention itself.

(Chaudoir et al., 2013; Wallerstein et al., 2018). There is a growing body of literature about the impact participatory processes have on implementation effectiveness (Lucero et al., 2018; Wise et al., 2012) and this thesis has shown that a) participatory processes are frequently used in implementing Indigenous health interventions (Chapter Three) and b) health professionals and researchers in various settings think it is a key factor for effectiveness (Chapters Four, Five, and Six).

Community engagement is a facilitating aspect that is regularly discussed in literature (Smith, 2013; Wallerstein et al., 2018). Chapter Three identified that community engagement is frequently employed when implementing health interventions with Indigenous communities. Further, participants from Chapter Four mentioned community engagement includes having members from the community included in the design of the intervention, empowering role models or community leaders during the implementation process and utilising an authentic co-design approach in every stage of the implementation of the health intervention. This is consistent with extant literature as community engagement reinforces the importance of including Indigenous and Māori views to create an intervention that is reflective of their values and aligns with cultural practices (Smith, 2012). Community engagement works to create positive changes in power relations, intervention sustainability, and community transformation (Wallerstein et al., 2018).

It has already been noted in a previous theme that when the voices of communities are prioritised in the implementation process it increases community autonomy and self-determination (Nuku, 2013). These community voices are a key part of the culture-centered approach which Chapter Three identified studies with the highest level of the culture-centered approach included community voice in defining the problem and identifying a solution. Findings from Chapter Four elaborate on this by sharing how the use of community voice improves the quality of the intervention as communities feel like they have some control over how the intervention will look allowing the intervention to be community led. Supporting literature also identified that when the community is involved in the design of the intervention, the members are more receptive to it (Simonds & Christopher, 2013). Unfortunately, for many Indigenous health interventions the use of community voice can be surface level where simple consultation at the beginning of the implementation is all that has been carried throughout the entire implementation process (Smylie et al., 2014). However, when community voice is used appropriately it supports the previous theme of community self-determination by empowering

Indigenous communities and giving them a voice and a choice in the implementation process (Huria et al., 2014; Nuku, 2013).

Organisational teams is another participatory factor that contributes to effective implementation. Organisational teams refer to the importance of everyone in the organisation working collaboratively to effectively implement the health intervention with Indigenous communities. In Chapter Six, this theme was rated as one of the most important variables for implementation effectiveness in Māori communities which is consistent with the literature on the importance of effective teamwork (Shortell et al., 2004). This is a participatory factor as it fosters an environment in the organisation where all those involved in the implementation are working towards a common goal (Bach-Mortensen et al., 2018). This shared understanding within the organisation facilitates the integration of organisational and community members working collaboratively to effectively implement Indigenous health interventions (Bach-Mortensen et al., 2018).

However, Chapter Four identified a barrier to participatory processes when organisations use participatory labels (such as co-design) as a fashionable label to convince communities to working with the organisational or implementation team. This creates mismanaged expectations. Mismanaged expectations affect the trust built within the implementation team and leads to miss understandings that impact the effectiveness of the intervention (Lucero et al., 2018; Wallerstein & Duran, 2010). This is particularly important for Indigenous communities as the effects of colonisation are still felt today and participatory approaches help to create interventions that resonate with communities and build trust after past violations (Durie, 2004). Therefore, both the organisation and community should set clear guidelines of the participatory processes before collaborating to ensure expectations are well established from the beginning of the implementation process.

Overall, this theme reinforces the idea that Indigenous health interventions should include participatory processes. These processes ensure a culture-centered approach that prioritises community engagement and voice while also highlighting the importance of organisational teams.

To conclude this section, the themes discussed are an effort to present facilitating aspects of implementation effectiveness for Indigenous health interventions. Each theme is relevant to Figure 1 and presents elements that relate to the diffusion, translation and dissemination of

Māori and Indigenous health interventions. Equally important are the barriers identified in these themes and how they affect the effectiveness of implementation processes. The following section discusses the implications of the inclusion of the HPW framework and demonstrates how including Māori and Indigenous perspectives in the implementation process can lead to better implementation processes for Indigenous health interventions.

7.3. Implications for Māori Implementation Science

This section of the chapter presents the implications of this thesis for Māori and Indigenous implementation science. The implications offer an opportunity to summarise the key messages from this research and how they support and extend the current perspectives on mainstream and Indigenous implementation science. There have been many significant findings in this thesis and the implications draw on those and highlights four key areas: the HPW framework, the field of implementation science, district health boards and Indigenous and Māori communities.

This research has highlighted the potential of the HPW framework (Oetzel et al., 2017) to be utilised as an effective tool for implementing Indigenous health interventions. HPW emphasises the translation and implementation of health interventions providing key practices when engaging with Indigenous communities. This research demonstrates that the HPW framework provides a guide on what is perceived as low and high engagement with Indigenous communities and the impact the different engagement levels will have on the implementation process. Each key component of the framework improves the implementation process and creates sustainable health outcomes for Indigenous communities. The studies included in this thesis highlight how community engagement and the culture-centered approach facilitate community autonomy and self-determination, while systems thinking and integrated knowledge translation highlight the importance of building sustainability into the design of the health intervention (Oetzel et al., 2017; Rarere et al., 2019). More specifically, community autonomy and self-determination ensure a sense of ownership which promotes the acceptability of the health intervention. While sustainability ensures there are deliberate actions taken by the project team to incorporate high levels of systems thinking and integrated knowledge translation into the intervention so that it is able to continue beyond the study period. The findings in this research provide compelling evidence that informs effective implementation processes of health interventions when engaging with Indigenous communities.

Secondly, this research has implications for implementation science as it addresses key facilitators and barriers of co-creating, adopting, and adapting Indigenous health interventions which develops an Indigenous and Māori implementation science platform. Current implementation science literature focuses on the short-term outcomes of the health intervention with little focus paid to the long-term outcomes nor relationship building with community partners (Chaudoir et al., 2013; Delafield et al., 2016; Wallerstein et al., 2018). Table 7.1 provides the commonalities and differences identified in this study between Indigenous and Māori implementation science (IMIS) and mainstream implementation science (MIS). The key elements for implementation identified in this research are: 1) process: the preferred method for implementation (Duckers et al., 2008; Wallerstein et al., 2020), 2) innovation: the characteristics of the intervention (Pankratz et al., 2002; Peters et al., 2002), 3) community: the community involvement in the process (Wallerstein et al., 2020), 4) organisation: the organisations approach to implementation (Duckers et al., 2008; Hutchinson & Johnston, 2004; Shea et al., 2014; Wallerstein et al., 2020 and 5) individual: the preferred skills of an individual (Goh & Richards, 1997; McCormack et al., 2009; Upton & Upton, 2006).

The process of MIS tends to heavily depend on being expert or researcher led within the health system (Bishop, 1998; Chaudoir et al., 2013) while IMIS prioritises participatory approaches that are co-led by the experts and the community members. Second, both MIS and IMIS appreciate evidence-based innovations. However, MIS prioritises Western and novelty innovations and IMIS value innovations that are inclusive of mātauranga Māori (knowledge) (Chaudoir et al., 2016; Pitama et al., 2014) which is also reflective of the two processes preferred by each approach. Third, both approaches consider community engagement essential in the implementation process. The difference is MIS considers consultation an appropriate level of community engagement while IMIS emphasises shared decision making throughout the implementation of the intervention (Huria et al., 2014; Ortiz et al., 2020). Fourth, both approaches see the importance of organisation support, and particularly organisational teams, to the implementation process (Bach-Mortensen et al., 2018; Chaudoir et al., 2016; Shortell et al., 2004). Fifth, both approaches acknowledge the individuals work experience they bring to the implementation process. However, IMIS also places value on the cultural competency an individual may have that will also contribute to their implementation efforts (Huria et al., 2014; Pitama et al., 2014). In summary, this table demonstrates the fundamental differences that affect the implementation process for Indigenous communities. Therefore, this research highlights Indigenous approaches to implementation science which is the importance of

including Indigenous voices and perspectives to increase implementation effectiveness resulting in long-term outcomes for Indigenous communities.

Chapter 7 - Table 1: Table of comparisons between Indigenous and Māori implementation science and mainstream implementation science

	IMIS	Common	Mainstream IS
Process	Participatory		Health system/expert/ researcher led
Innovation	Mātauranga Māori	Evidence based	Western/novelty and innovation
Community	Shared decision making	Community engagement	Consultation
Organisation		Organisation support and organisational teams	
Individual (skill)	Cultural competency	Work experience	

Thirdly, this research has implications for District Health Boards (DHBs). Three out of the four studies included health professionals' perspectives which was an intentional effort to illuminate their knowledge and experience of working with/for Māori communities. The New Zealand health system and DHBs are constantly striving to enhance Māori health equity and health professionals have identified key facilitating processes that are consistent with Kaupapa Māori methods. When the health professional is pro co-design, it reinforces community views and increases the probability of implementation effectiveness when engaging with Indigenous communities. This study highlighted that health professionals want to follow Kaupapa Māori principles as they think it will enhance implementation effectiveness. The key for health professionals is having supportive organisation structures that supply sufficient funding and time to build mutually beneficial relationships with community members. DHBs can use the findings from this research to explore the implications of IMIS within their organisations and determine if it enhances implementation effectiveness.

Finally, this thesis has implications for Indigenous and Māori communities as it reinforces the growing trend of co-design and collaboration with communities in health research, interventions and services. Māori communities have long advocated community autonomy and participatory processes for developing health systems and health intervention consistent with the Treaty of Waitangi (Durie, 2004; Kingi, 2007; Pitama et al., 2014). This research provides empirical evidence to support their established preferences. This evidence provides rational for

Indigenous communities for ensuring their voices are prioritised in the design to ensure Indigenous views and knowledge are included in the implementation of health interventions. Autonomy has not been handed to the Indigenous communities, but rather it has been demanded by many Indigenous cultures (Durie, 2004). This demand has proved to be beneficial for Māori as community engagement becomes more frequent in implementation science and highlights the potential to achieve more sustainable health outcomes.

7.4 Limitations and Conclusions

This final section presents the limitations of the research with recommendations for future studies to consider in implementation science. Finally, to conclude this chapter a personal reflection and closing remarks present the conclusion for this research.

7.4.1 Limitations

A number of limitations applied to this research. Firstly, the majority of the participants interviewed for this thesis were health professionals and researchers that were largely in favour of co-design and CBPR approaches. Therefore, the themes may favour their perspectives and have a heavy focus on the facilitators and benefits of these approaches. This is a limitation as the voices of those whose research or practice does not involve these approaches may not be fully represented in this thesis. I made efforts to include a range of voices although the snowball sampling likely contributed to this limitation (i.e., people referred me to those with similar views). Future research can directly seek out counter co-design voices directly to ensure a more inclusive approach. However, it is important to note that the final study was a random sample of health professionals and they supported co-design so that helps to temper this limitation. Future studies should also focus on the perceptions of the community towards co-designing health interventions; these studies should aim to determine if similar facilitators and barriers are identified.

The next limitation focuses on missed articles and opinions. The findings and conclusions of this thesis are based on the data and participants we had access to or knew about. While I attempted to be rigorous in my search strategy for both literature and participants, it is possible that relevant studies and perspectives have not been included in this thesis. Particularly I do not know how representative the Qualtrics panel is and thus the external validity of the findings is questionable. Also as I was conducting my data collection during COVID-19, many participants were unavailable during the pandemic which affected the opinions reflected in the

study. Finally, although I endeavoured to find useful answers for all Indigenous communities for implementation effectiveness, the findings for this thesis are quite specific to a Māori/New Zealand audience as all of the participants reside in New Zealand and spoke of their experience implementing health interventions with Māori communities. Future studies should build on the implications of this study and consider the voices and opinions of those who were missed in the current study to determine if including Indigenous voices in the implementation process still contributes to the evidence of co-design being a preferable option for engaging with Indigenous communities.

A final limitation of this thesis is that the studies included did not directly investigate the structural issues of implementing an intervention. Many of the studies noted the impact structural issues have on implementation; however, these findings are limited due to the lack of data available on this topic. The limited data can be attributed to the lack of questions pertaining to the impact structural issues have on health professionals and researchers and how they affect the implementation process. Future research should explore how health professionals navigate the systemic and structural issues in their organisations to incorporate more community based practices into their spaces.

7.4.2 Conclusion

I would like to take this opportunity to reflect on my PhD journey and share four pivotal moments where my research began to 'click' into place and brought me clarity as these moments help me understand the importance of this issue and provide a frame for my conclusion. The first moment occurred when I was collecting data for my first publication (Chapter Three) and I became frustrated at the lack of articles discussing the implementation of Māori health interventions. From my personal experience, I knew of many Māori health interventions and I wondered why I could not find the published articles. It was a good friend of mine who said to me "you won't find much because we are too busy actually doing the work (implementing health interventions) to be writing and publishing about it". This was a moment for me that made me realise Māori academics are stretched thin and we need more of us to publish the work we are doing in the communities. By publishing the outcomes of the health interventions, it contributes to the evidence-based literature that supports Māori practices and approaches to implementing health interventions.

The second moment occurred in the development of the KMM project when I was fortunate to be involved in the design of the orientation programme for the kaumātua. To be a part of the team who wrote the structure, the guidelines, and the values of the programme opened my eyes to the reality of how translation from theory to practice works in implementation science. Experiencing first-hand how everything comes together to create, design and implement health interventions was an exciting time in my PhD journey. Although my involvement in the design team was not as significant as the senior academics and community members, I was grateful for the opportunity to learn from those who have previously created and implemented health interventions and fill my basket of knowledge with the expertise they shared with me.

Another moment followed the analysis of my findings for Chapter Four. I was not aware of the amount of health professionals who are already working so hard to dismantle the system that cripples Māori health. It was inspiring to see both Māori and non-Māori health professionals and researchers working in the health system pushing for more collaborative and holistic approaches. Through interviewing participants I learned how health professionals were practically putting steps in place to try and include community voice and autonomy in the implementation process.

The final moment of clarity followed a personal event that affected my health and required me to seek medical assistance. I was fortunate that the medical staff were polite in discussing my health issue. However, according to the Western medicine system and their measures of health I was not 'sick enough' to receive further government funded treatment. As someone who regularly engages with the health system given my topic of research I was not surprised by this. However, it put me in the shoes of every other Māori who has been treated this way by the New Zealand health care system. For me, this moment made it abundantly clear that my research needed to provide evidence supporting the notion that Māori knowledge and practices are what is best for improving Māori health equity.

Collectively, these moments reinforced my beliefs that research regarding effective implementation of health interventions is crucial to addressing the health inequities Indigenous populations face. Therefore, in conclusion, the purpose of this thesis was to highlight the facilitators and barriers of implementing health interventions with Māori communities in New Zealand. The findings of this thesis contribute to the conversation about reducing health inequities Māori communities' face in New Zealand by enhancing implementation

effectiveness. The implications of this research highlighted that Indigenous and Māori implementation science should focus on participatory approaches that lead to sustainable outcome for Indigenous health interventions. In doing so, this ensures a cultural-centered approach that prioritises Indigenous knowledge and promotes Indigenous autonomy in the key stages of implementation. Furthermore, the barriers identified in this thesis recognise the challenges that remain in limited funding for translating research into implementation practice and managing expectations amongst the implementation team. These implications are crucial for implementation science as they isolate key areas of improvement needed to advance Indigenous health outcomes. Overall, the findings in this thesis are an effort to move towards achieving health equity and increasing positive health outcomes for all Māori and Indigenous communities.

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Appendices

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Appendix One: Chapter 3 Co-Authorship Form

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Harding, T., & Oetzel, J. (2019). Implementation effectiveness of health interventions for indigenous communities: a systematic review. *Implementation Science*, *14*(1), 76. https://doi.org/10.1186/s13012-019-0920-4

Nature of contribution by PhD candidate	Research design, data collection and analysis, writing
Extent of contribution by PhD candidate (%)	80%

CO-AUTHORS

Name	Nature of Contribution
John Oetzel	20 % Research design, analysis, editing and some writing

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
John Oetzel		27/1/21

July 2015

Appendix Two: Chapter 3 Clearance Form

- ⌄ Preparing your manuscript
- Prepare supporting information
- Conditions of publication
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Appendix Three: Chapter 4 Research Information Sheet

He Pikinga Waiora: Making Health Interventions work for Maori communities

He Pikinga Waiora is a core project within the Healthier Lives National Science Challenge research programme which aims to identify what makes health interventions work for Maori communities. He Pikinga Waiora is partnering with communities and agencies to explore the role of community partnerships and matauranga Maori in the development of sustainable and effective evidence based interventions for slowing the progress of pre-diabetes to diabetes amongst Māori.

The project will integrate kaupapa Maori, systems thinking and implementation science to promote transformational improvements in health service delivery. It will develop a Healthier Lives Implementation Framework to provide a foundation for agencies to effectively engage with Māori communities and facilitate the translation of research findings into improvements in health service delivery which achieve health equity and improve health gain for Maori.

The project is funded by the Ministry of Business, Innovation & Employment as part of the National Science Challenge. The research is a collaboration among several institutions including the University of Waikato (lead organisation), University of Auckland (Waikato Clinical School), University of Otago, ESR, and Whakauae Research Services. The principal investigators are Maui Hudson (Waikato), John Oetzel (Waikato), and Nina Scott (Waikato Clinical School). Core research team members also include Angela Beaton (Wintec), Jeff Foote (ESR), and others.

During the initial phases of this project, we will be developing a systems map and also completing process evaluation of the research. We will invite key stakeholders, members of the Sector Working Group, and participants from each of the community organisation to participate in an interview and/or Internet Survey Questionnaire. The interview will typically last 30-45 minutes and the Internet Survey will last about 15-20 minutes. The questions ask about your perceptions about the co-design in the health system, implementing health interventions, and the research process. No personal information is included in the questionnaire other than demographics.

We will compile the results in an aggregate form so as not to identify individuals. The raw data will only be viewed by core team members and their assistants. Data will be stored in password protected computers/drives. The raw data will be analysed and aggregated and then distributed in various formats including research articles, conference papers, community reports, policy briefs and student thesis.

Participation in the data collection is voluntary and you may choose not to answer any specific questions as well. After participating, you may choose to opt out of the study by informing the researchers listed below within two weeks of participating. If you'd like more information about the project, please contact the following:

Truely Harding
truely.harding@gmail.com

Appendix Four: Chapter 4 Consent Form

Waikato Management School
Te Raupapa

THE UNIVERSITY OF
WAIKATO
Te Whare Wānanga o Waikato

He Pikinga Waiora: Making Health Interventions work for Maori communities

Consent Form for Participants

I have read the **Information Sheet for Participants** for this study and have had the details of the study explained to me. My questions about the study have been answered to my satisfaction, and I understand that I may ask further questions at any time.

I also understand that I am free to withdraw from the study at any time, or to decline to answer any particular questions in the study. I agree to provide information to the researchers under the conditions of confidentiality set out on the **Information Sheet**.

I agree to participate in this study under the conditions set out in the **Information Sheet** form.

Signed: _____

Name: _____

Date: _____

Researchers' Name and contact information:

Truely Harding
truely.harding@gmail.com
021 0234 5931

John Oetzel
joetzel@waikato.ac.nz
07 838 4431

Appendix Five: Chapter 4 Co-Authorship Form

Co-Authorship Form

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Please indicate the chapter/section/pages of this thesis that are extracted from a co-authored work and give the title and publication details or details of submission of the co-authored work.

Harding, T., Oetzel. J. G., Foote, J., & Hepi, M. (2020). Perceptions of co-designing health promotion interventions with Indigenous communities in New Zealand. *Health Promotion International* https://doi.org/10.1093/heapro/daaa128

Nature of contribution by PhD candidate	Research design, data collection and analysis, writing
Extent of contribution by PhD candidate (%)	80%

CO-AUTHORS

Name	Nature of Contribution
Prof. John Oetzel	10% Some writing and editing
Jeff Foote	5% Some data collection, editing and study conceptualisation
Maria Hepi	5% Some data collection, editing and study conceptualisation

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
Prof. John Oetzel		27/1/21
Jeff Foote		28/1/21
Maria Hepi		29/1/21

July 2015

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Appendix Six: Chapter 5 Research Information Sheet

Kaumātua mana motuhake: Kaumātua managing life-transitions through tuakana-teina/peer- education

Funded by Ageing Well National Science Challenge

Tēnā koe

My name is Truely Harding, a PhD student at the University of Waikato, and I am working in collaboration with a team of researchers from Rauawaawa and the University of Waikato's Faculty of Māori and Indigenous Studies—led by Professor Brendan Hokowhitu—and Faculty of Management—led by Professor John Oetzel. The other researchers working on this project all of whom have the approval of the Board of Trustees of Rauawaaawa.

What is the project about?

The aim of the wider project was to develop a training programme to assist kaumātua working through life transitions such as loss of spouse, retirement, health problems, and loss of independence. The training involved a tuakana/teina model to enhance kaumātua mana motuhake (autonomy and identity).

The aim of this study is to provide key findings about disseminating this health intervention in to different places with different groups of interests and the potential of changing the size of the intervention.

What am I being asked to do?

I would like to invite you to be a participant in this project. This will involve a 30min-1hr interview with you to offer your insights about your work and how this project could be useful for your workplace. Your participation is entirely voluntary (your choice) and you do not have to take part in this project if you choose not to.

Your rights as a participant

As a Participant in this research project, you have the right to:
- know that participation is voluntary and a refusal to participate will not affect you in any way;
- ask any questions about the project at any time during participation;
- provide information on the understanding that your identity will not be disclosed in any way, shape or form, or in the final report of the project;
- withdraw from this research, at any time, without giving reasons for doing so, and that this will not have a negative effect on the services I currently or potentially receive from the providers that have referred me to this research; specifically, you should notify us after the interview (which means that you can participate and then ask us not to use your information)
- decline to be audio recorded and request the recorder be turned off at any time you are speaking
- to receive a summary of your transcript to change and/or comment on, and to request a full copy of your focus group/interview transcript;
- decline to answer any particular question during the discussion, and;
- access a summary of the findings from the study, when it is concluded.

If you have any questions or queries about the project or your participation, you are encouraged to contact the three lead researchers at the details below.

Confidentiality and the Results

Statements you make may be referred to as part of the analysis. I will ensure to the best of my abilities that all interviews and discussion will remain confidential and a pseudonym (fake name) will be used in any publications so that you will stay anonymous. All written notes and transcripts will be kept on a password protected computer. Only the research team will have access to the transcripts and electronic information.

The results of the interviews will be analysed and aggregated so as not to identify an individual person. I will look for common themes across the various people that we interview and then share those in various formats including research articles, conference papers, community reports, policy briefs and student research reports.

What next?

One of two things will happen. If you agree to participate and we are already together, we can conduct the interview now. If you are looking at this sheet and I'm not with you, I will contact you in the next week so that we can organise a time to meet. If you have any questions about the research, please feel free to contact me or one of the researchers for the project.

Aku mihi nui ki a koe

Truely Harding, truely.harding@gmail.com; 02102345931
John Oetzel, john.oetzel@waikato.ac.nz; 07 838 4431
Rangimahora Reddy; rangimahora@rauawaawa.co.nz; 07 847 6980

Waikato Management School
Te Whare Wānanga o Waikato/ The University of Waikato
Private Bag 3105
Hamilton, New Zealand

Appendix Seven: Chapter 5 Consent Form

Te Manu Tāiko   Te Whare Wānanga o Waikato

Human Research Ethics Committee   Private Bag 3105

Te Pua Wānanga ki te Ao   Hamilton 3240

Faculty of Māori and Indigenous Studies   Phone: 64-7-838 4737

& Te Kotahi Research Institute   E-mail: fmis@waikato.ac.nz

Title: Kaumātua mana motuhake: Kaumātua managing life-transitions through tuakana-teina/peer- education

Researcher: Truely Harding

1. I have read the 'Information Sheet' for this study and have had details of the study explained to me.
2. My questions about the study have been answered to my satisfaction, and I understand that I may ask further questions at any time.
3. I also understand that I am free to withdraw from the study at any time, or to decline to answer any particular questions in the study.
4. I agree to provide information to the researchers under the conditions of confidentiality set out on the information sheet.
5. I wish to participate in this study under the conditions set out in the 'Information Sheet'.
6. I would like my information: (circle option)
    a) returned to me
    b) returned to my family
    c) other(please specify)…………………………………………….
7. I consent/do not consent to the information collected for the purposes of this research study to be used for any other research purposes. (Delete what does not apply)

Participant's Name: _____

Participant's Signature: _____

Date: /   /

Contact details: _____

                        _____

Researcher's Name:

Researcher's Signature: _____

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Please indicate the chapter/section/pages of this thesis that are extracted from a co-authored work and give the title and publication details or details of submission of the co-authored work.	

Identifying the facilitators and barriers in disseminating and adopting a health intervention developed by a community-academic partnership. By Harding, T., Oetzel, J. G., Simpson, M., & Nock, S. Submitted to Health Education and Behavior on 27/01/2021

Nature of contribution by PhD candidate	Research design, data collection and analysis, writing
Extent of contribution by PhD candidate (%)	80%

CO-AUTHORS

Name	Nature of Contribution
Prof. John Oetzel	10% Research conceptualization and design; some writing and editing
Dr. Mary Simpson	5% Some writing and editing and research conceptualisation
Dr. Sophie Nock	5% Some writing and editing and research conceptualisation

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
Prof. John Oetzel	*[signature]*	27/1/21
Dr. Mary Simpson	*[signature]*	28/11/21
Dr. Sophie Nock	*[signature]*	28/11/21

July 2015

Appendix Nine: Chapter 6 Research Information Sheet

Waikato Management School
Te Raupapa

THE UNIVERSITY OF
WAIKATO
Te Whare Wānanga o Waikato

Facilitators and barriers for the implementation and dissemination of health interventions with Māori communities.

Purpose of the research

Kia ora, my name is Truely Harding and I am a PhD student at the University of Waikato. As a part of my doctoral studies I am conducting this survey to investigate the perspectives of health professionals in New Zealand on implementing Māori/Indigenous health interventions. In particular, there is a focus on the facilitators and barriers health professionals believe contribute to the adaptation of the health intervention in Māori communities.

What's involved for the participants?

I invite you to participate in a 10-15 minute survey to provide your perspectives on the facilitators and barriers for implementing and disseminating health interventions with Māori communities. Please try to answer all the questions, although you do not have to answer all the questions if you choose.

What will happen to material collected?

The information you provide from the survey will be used to write a peer-reviewed journal article that will also be a part of my thesis. Any relevant information that you provide the study will be used in the manuscript but no identifying information is collected. Once the research is completed, all data will be stored indefinitely on a password locked computer.

Your rights as a participant

As a Participant in this research project, you have the right to:
- know that participation is voluntary and a refusal to participate will not affect you in any way;
- ask any questions about the project at any time during participation;
- decline to answer any particular question during the discussion, and;
- access a summary of the findings from the study, when it is concluded.

During the survey, you can withdraw by closing your browser. Your responses will be removed as incomplete before the survey data is analysed. At the end of the survey, you will be asked to SUBMIT your responses. Once you have submitted your responses, you can no longer withdraw from the survey, as your responses are anonymous.

How to get more information?

If you would like more information or have any further questions please do not hesitate to contact me at truely.harding@gmail.com, my supervisor at john.oetzel@waikato.ac.nz or the University of Waikato's Human Research Ethics Committee at humanethics@waikato.ac.nz.

Ngā mihi
Truely Harding

I have read the information about this study and agree to participate in the survey. I understand that when I submit my responses that I will not be able to withdraw my responses as no identifying information is being collected.

START SURVEY

Appendix Ten: Chapter 6 Consent Form (Email)

Facilitators and barriers for the implementation and dissemination of health interventions with Māori communities.

Kia ora, my name is Truely Harding and I am a PhD student at the University of Waikato. As a part of my doctoral studies I am conducting this survey to investigate the perspectives of health professionals in New Zealand on implementing Māori/indigenous health interventions. In particular, there is a focus on the facilitators and barriers health professionals believe contribute to the adaptation of the health intervention in Māori communities.

I invite you to participate in a 10-15minute survey to provide your perspectives on the facilitators and barriers for implementing and disseminating health interventions with Māori communities.

Attached is an information sheet to provide you more context of the project and your role in participating.

I look forward to hearing from you.

Ngā mihi
Truely Harding

Appendix Eleven: Chapter 6 Co-Authorship Form

Co-Authorship Form

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Postgraduate Studies Office
Student and Academic Services Division
Wahanga Ratonga Mātauranga Akonga
The University of Waikato
Private Bag 3105
Hamilton 3240, New Zealand
Phone +64 7 838 4439
Website: http://www.waikato.ac.nz/sasd/postgraduate/

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Implementation effectiveness of health interventions with Māori communities: A cross-sectional survey of health professional perspectives. By Harding, T., & Oetzel, J. Under editorial review at Australian & New Zealand Journal of Public Health.

Nature of contribution by PhD candidate	Research design, data collection and analysis, writing
Extent of contribution by PhD candidate (%)	80%

CO-AUTHORS

Name	Nature of Contribution
Prof. John Oetzel	20% Research design, some writing and editing

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
Prof. John Oetzel		27/1/21

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Appendix Twelve: Chapter 6 Copyright Form

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Manuscript number: 2020-174

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Contributor's signature (type name here):   Truely Harding

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Glossary

Ako Māori	Māori world view (Kaupapa Māori Principle)
Aotearoa	New Zealand
Hā-a-koro-mā-ā-kui-mā	Inspiration from ancestors (Te Wheke)
Hauora	Wellbeing
He Pikinga Waiora	A Māori implementation framework
Hinengaro	Mental
Iwi katoa	Societal structures (Meihana Model)
Kaimahi	worker
Karakia	Prayer
Kaumātua	elder
Kaumātua Mana Motuhake	Kaumātua managing life-transitions through tuakana-teina/peer-education
Kaupapa Māori	An Indigenous research methodology
Kete	Basket
"Kia piki ake i ngā raruraru o te kainga"	Socio-economic mediation (Kaupapa Māori Principle)
Mana ake	Uniqueness (Te Wheke)
Mana motuhake	Self-actualisation and autonomy
Mana whakahaere	Autonomy (Te Pae Mahutonga)
Māori	Indigenous people of New Zealand
Mātauranga	Knowledge
Mauri	Vitality (Te Wheke)
Mauriora	Cultural identity (Te Pae Mahutonga)
Mihimihi	Formal introductions
Ngā Manukura	Community leadership (Te Pae Mahutonga)
Noa	Ordinary
Pākeha	Western
Taha hinengaro - psychological	Psychological (Whare Tapa Whā Model)
Taha tinana	Physical (Whare Tapa Whā Model)
Taha wairua	Spiritual (Whare Tapa Whā Model)
Taha whanau	Social (Whare Tapa Whā Model)
Taiao	Physical environment (Meihana Model)
Taonga tuku iho	Cultural aspirations (Kaupapa Māori Principle)
Tapu	Sacred
Te Oranga/Waiora	Participation in society (Te Pae Mahutonga)
Te reo Māori	The Māori language
Te Tiriti o Waitangi	The Treaty of Waitangi
Tikanga	Traditions
Tinana	Body Physical well-being (Meihana model) Physical (Te Wheke)
Tino rangatiratanga	Self-determination (Kaupapa Māori Principle)
Toiora	Healthy lifestyle (Te Pae Mahutonga)
Tuakana-teina	Older sibling-younger sibling
Waiora	Physical environment (Te Pae Mahutonga) Connection to the external world (Te Wheke)

Wairua	Spiritual essence Psychological practice (Meihana Model)
Wairuatanga	Spirituality (Te Wheke)
Whakaaro	thoughts
Whakataukī/whakatauakī	Proverb
Whānau	Family (Kaupapa Māori Principle) Support networks (Meihana Model)
Whanaungatanga	Family (Te Wheke)
Wharenui	Community meeting house
Whatumanawa	Emotions (Te Wheke)