MAI Journal A NEW ZEALAND JOURNAL OF INDIGENOUS SCHOLARSHIP

DOI: 10.20507/MAIJournal.2026.15.1.15

WEAVING MAATAURANGA

The Ko Tuna Anahe framework for culturally responsive type 2 diabetes education for Maaori communities

*Rebekah Crosswell**
Hinetu Nikora†
Ryan Paul‡
Rawiri Keenan§
Tom Roa||
Cathy Buntting¶
*Apo Aporosa***
Capri Paekau††
Glenda Raumati‡‡
*Suzanne Moorhouse****
Anna Tiatia Fa'atoese Latu†††

* Te Whakatōhea. Research Officer, Division of Health, School of Equity and Innovation, University of Waikato, Kirikiriroa | Hamilton, New Zealand. Email: rebekah.crosswell@waikato.ac.nz
† Tuhoe, Waikato, Te Aitanga-a-Hauiti. Research Assistant, Division of Health, School of Equity and Innovation, University of Waikato, Kirikiriroa | Hamilton, New Zealand.
‡ Ngāti Māru, Hauraki. Associate Professor of Medicine, Division of Health, School of Equity and Innovation, University of Waikato, Kirikiriroa; Te Whatu Ora Waikato, Kirikiriroa | Hamilton, New Zealand.
§ Te Atiawa. Associate Professor of Medicine, Division of Health, School of Equity and Innovation, University of Waikato, Kirikiriroa | Hamilton, New Zealand.
|| Ngāti Maniapoto, Waikato, Ngāti Apakura. Professor, Te Pua Wānanga, Faculty of Maaori and Indigenous studies, University of Waikato, Kirikiriroa | Hamilton, New Zealand.
¶ Senior Lecturer & Director of Science Learning Hub, Te Kura Toi Tangata—School of Education, University of Waikato, Kirikiriroa | Hamilton, New Zealand.
** Vasu ni koro | Naduri, Fiji. Duruvesi—Bula ni Pasivika | Senior Lecturer in Pacific Health, Division of Health, School of Equity and Innovation, University of Waikato, Kirikiriroa | Hamilton, New Zealand.
†† Waikato Tainui. Research Assistant & Mate Huka Programme Lead, Ngā Miro Community Health Centre, Waikato, New Zealand.
‡‡ Waikato Tainui. Kaiwhakahaere, Ngā Miro Health, Ngā Miro Community Health Centre, Waikato, New Zealand.
*** Nurse Lead & Diabetes Nurse, Hauraki Primary Health Care Organisation, Kirikiriroa | Hamilton, New Zealand.
††† Kai Tahu. Programme Director, Doctor of Medicine, Division of Health, School of Equity and Innovation, University of Waikato, Kirikiriroa | Hamilton, New Zealand.

Abstract

The significant burden of type 2 diabetes (T2D) for Maaori populations highlights the crucial need for culturally responsive health education. This study used Kaupapa Maaori participatory action research methodology in collaboration with a semi-rural Waikato community to develop tailored T2D educational resources. The process included initial consultation, thematic analysis, resource development, community feedback, and final refinement. Eleven participants (aged 35–44) engaged in focus groups to ascertain their preferences for educational materials. Maaori researchers undertook thematic analysis, integrating Kaupapa Maaori concepts and a strength-based perspective. Two themes emerged: mātauranga (the pursuit of knowledge, truth, and intergenerational wisdom) and whaanau aspirations (focusing on cultural identity and whaanau-centred approaches). These themes underpinned the development of the Ko Tuna Anahe framework and, in turn, the resources of a website and book. Community feedback was overwhelmingly positive, confirming the resources' cultural appropriateness and accessibility, and demonstrating the value of community-led, culturally embedded approaches in health education.

Keywords

type 2 diabetes, Maaori health, Kaupapa Maaori, participatory action research, health education, community engagement

Introduction

Type 2 diabetes (T2D) presents a significant and growing global health challenge, and Indigenous populations, including Maaori in Aotearoa New Zealand, experience a disproportionately higher burden (Ministry of Health, 2023). This disparity manifests in earlier T2D onset, increased complications, and poorer health outcomes (Ministry of Health, 2022, 2023; Olokoba et al., 2012; van Dieren et al., 2010).

These disparities have their source in complex historical and socio-economic factors. Colonisation has disrupted traditional Maaori ways of life, leading to land alienation, eroded cultural practices and language, and the suppression of maatauranga Maaori (Moewaka Barnes & McCreanor, 2019). The adoption and prioritisation of Westernised knowledge and healthcare systems has further contributed to systemic inequities in healthcare access and outcomes (Curtis et al., 2022), fuelling health disparities that manifest in significantly higher rates of morbidity and mortality for Maaori (Ministry of Health, 2023). This reality points to the critical need for T2D educational interventions that focus on solutions, actively address the core causes of inequity, and advance Maaori health outcomes.

Type 2 Diabetes (T2D) disparities are often incorrectly viewed as purely social or individualistic issues. However, international research provides conceptual precision to this link by demonstrating a direct relationship between Indigenous-specific traumatic life experiences and increased cardiometabolic risk (Lewis et al., 2021). This risk is explicitly mediated by a psychophysiological trauma stress response (Lewis et al., 2021). This underscores that the suppression of maatauranga Maaori is not only a cultural loss but a physiological driver of metabolic inequity.

Effective diabetes management necessitates comprehensive education encompassing kai, medication, physical activity, and lifestyle adjustments (Świątoniowska et al., 2019). Such education is crucial for fostering coping skills, enhancing collective agency regarding diabetes knowledge, and improving engagement with healthcare services (Powers et al., 2017). Education has the potential to drive positive behavioural change, enhance medication adherence, and increase both quality of life and mental resilience (Świątoniowska et al., 2019).

Despite a range of existing educational modalities in Aotearoa, including written materials (Diabetes New Zealand, 2024), technology-based platforms (Dobson et al., 2015; Farmer et al., 2016), and group education (Krebs et al., 2013; Tipene-Leach et al., 2013), there remains a persistent scarcity of whaanau-led, culturally tailored T2D resources specific to the Aotearoa context (Crosswell et al., 2024). In turn, the lack of culturally meaningful resources often leads to patient dissatisfaction and reliance on informal information that perpetuates systemic failures (Bacal & Jansen, 2006; Chepulis et al., 2021; Crosswell et al., 2024; Jansen et al., 2011). There is a demand for approaches that affirm Maaori cultural identity, incorporate te reo Maaori and maatauranga Maaori, and are embedded within whaanau and community structures.

The aim of this study was to collaboratively

develop culturally responsive T2D educational resources for Maaori communities in the Waikato region, utilising a Kaupapa Maaori participatory action research (PAR) framework. Kaupapa Maaori research prioritises mana motuhake, ensuring research is conducted by, with, and for Maaori (Smith, 2017). Participatory action research aligns seamlessly with this paradigm by recognising whaanau as the "experts of their everyday lived experiences" (Eruera, 2010, p. 1). This approach shifts the focus from traditional data extraction to a process of community-led development. By centring community voices as active co-researchers, this methodology explicitly challenges the "individualising logic" of Western research, ensuring the resulting framework and resources are grounded in agency and social change (Cornish et al., 2023; Eruera, 2010).

Methods

The research team included a range of expertise and cultural representation, including clinicians and academics, Maaori researchers (RC, AL, HN, RP, RK), two New Zealand European researchers (CB, SM), and a Pacific researcher (AA). Through a diverse composition of researchers and clinicians with expertise in Maaori health, Kaupapa Maaori methodologies, endocrinology, education, and primary care, the study was supported to collect, analyse, and present data in ways that were both culturally sensitive and clinically accurate.

Ethical approval for this study was obtained from the University of Waikato Health and Human Research Ethics Committee (HREC[Health] 2024#14) and adhered to Te Ara Tika, the Health Research Council of New Zealand's ethical framework for Maaori health research (Hudson et al., 2010).

Setting

This study was carried out within a semi-rural Waikato community, a region with a rich Maaori cultural heritage. The Waikato River and its associated traditions, including the deep cultural significance of *tuna* as a traditional food source and symbol of sustenance and resilience, provided an important contextual backdrop for this research (Takerei, 2019; Waikato Raupatu River Trust, n.d.; Waikato Tainui, n.d.). Understanding the local environment was crucial for developing resources that would genuinely resonate with the community's lived experiences and cultural values. The study utilised an established community health programme and its associated community health centre. This locality was selected because it was well known and comfortable among local residents, advancing an environment of trust and familiarity, to support open dialogue.

Participants

Purposive inclusion criteria were established to ensure a depth of lived experience and community connection. Participants were required to identify as having Maaori whakapapa and maintain links to the semi-rural Waikato community and its health centre. Additionally, participants were eligible if they were personally living with T2D or provided support as a whaanau member or friend of someone with the condition.

Participants were recruited through a multi-faceted strategy. Initial outreach involved social media advertisements on the community centre's official Facebook page. Participants already engaged in a T2D exercise programme at the community health organisation were also directly invited to participate. Finally, a snowballing strategy (Naderifar et al., 2017) was employed, through which existing participants were invited to share information about the research with others in their networks who might be interested and eligible.

Prior to their participation, potential participants received a comprehensive participant information sheet detailing the study's purpose, aims, and participants' rights. Sufficient opportunity was provided for discussions to address any concerns or questions, ensuring fully informed consent was obtained before any data collection commenced.

In total, 11 participants aged between 35 and 44 years engaged in the initial consultation phase. While recruitment was inclusive of all ages, the cohort ultimately comprised individuals aged 35–44. Prioritising this age range provided deep insights into the experiences of Maaori facing earlier T2D onset. This is an area of significant concern given the rising prevalence of youth-onset and early-life T2D documented in current national health statistics (Ministry of Health, 2023).

These participants were divided into three focus groups: one group of five (four females, one male), one group of two (two females), and one group of four (three females and one male). Furthermore, the final focus group served as a dedicated space for community review, ensuring that the resulting outputs remained grounded in the participants' original aspirations.

Procedures

The research process was inherently iterative, reflecting the principles of PAR. It involved continuous dialogue, collaboration, and cycles of reflection and action with the community. Five distinct phases were undertaken:

Phase 1—Initial community consultation (focus groups). Engagement followed a set of rangahau tikanga designed to uphold the mana of the participants and the community. Before implementation, these protocols were reviewed and confirmed as culturally safe by the project's Kaupapa Maaori expert (ATL), community group kaiwhakahaere (GR), and kaimahi (CP), ensuring alignment with Te Ara Tika ethical principles (Hudson et al., 2010). Adherence to these practices, including the opening and closing of sessions with karakia and the allocation of significant time for whakawhanaungatanga, was essential to establishing trust. Such a rigorous vetting process by a recognised authority demonstrates that the methodology was not only suitable but specifically tailored to the cultural requirements of the community.

Focus groups were conducted kanohi ki te kanohi. A Maaori researcher (RC) and a research assistant (HN) were centrally involved in directing the focus groups. Additionally, a kaimahi from the community centre (CP) was present and actively involved in the focus group process. The involvement of the kaimahi ensured a familiar presence for participants. Before commencing, participants received and had verbally reiterated the information sheet detailing the study's purpose and aims, followed by the formal process of obtaining informed consent.

Following consent, whakawhanaungatanga was undertaken, during which participants were invited to introduce themselves and share their connections. Adherence to relational processes ensured that connections were established before moving into formal data collection.

Audio recordings were made of the focus groups, which ranged from 60 to 90 minutes in duration. Concurrently, one researcher (HN) meticulously collected written notes, capturing verbal and non-verbal cues, group dynamics (such as power dynamics, engagement levels, emotions, non-verbal cues, conflict, and agreement), and relevant environmental factors.

Participants were then presented with a diverse collection of existing educational resources. These included written materials (pamphlets collected from medical and community centres), websites (e.g., Diabetes New Zealand, Heart Foundation NZ, Te Whatu Ora, HealthEd, Ministry of Health, Healthify, Toi Tangata, Diabetes Foundation Aotearoa, Health Promotion Aotearoa), and video content (e.g., from Te Korowai Hauora o Hauraki and Healthify). Providing a plethora of education modalities allowed for a comparative analysis of participant preferences regarding education delivery.

Participants were encouraged to openly discuss their opinions on the presented resources. The conversation naturally evolved from these initial discussions. The following key research questions were posed in each focus group:

- What T2D topics would you like to see included in educational resources for Maaori?
- What do you like about the provided resources [and ones you may have received or seen during your T2D journey] and what don't you like?
- If you could create your own T2D resources for Maaori, what would they look like?

As a gesture of reciprocity and to acknowledge their valuable contributions and time, participants were gifted a $30 koha. Reciprocity was further extended through the sharing of kai at the conclusion of the focus groups, reinforcing collective participation and strengthening researcher–participant relationships and engagement with the community group.

Focus group data were initially transcribed using Kaituhi transcription software. Kaituhi was chosen because of its absence of artificial intelligence (AI) components, a critical decision made to protect Maaori data sovereignty (Lovett et al., 2019; Te Mana Raraunga: Māori Data Sovereignty Network, 2023). Transcriptions were then manually checked for accuracy, accents, and colloquial terms by the research team.

The preliminary analysis was conducted by three Maaori researchers (RC, AL, HN), guided by inductive analysis approaches and Kaupapa Maaori thematic analysis. Examination involved a deep immersion in the data: each transcript was read and reread multiple times to enable thorough absorption and understanding. During this process, areas of text deemed significant to the participants' narratives and experiences were systematically coded.

The researchers (RC, AL, HN) then worked collectively to synthesise these codes, identifying and highlighting main themes that consistently emerged from the data. Throughout this analytical process, Maaori worldviews and concepts were consistently integrated, ensuring that the findings

were authentically grounded in Maaori perspectives and values. A strength-based approach was specifically adopted to highlight the inherent resilience and capabilities of Maaori communities (Smith, 2017), rather than focusing on deficits as has historically been found in research with Indigenous communities (Hyett et al., 2019).

A clinical and academic advisory group (CAAG) provided overarching governance for the project. Independence within the governance structure was maintained through a diverse membership comprising Maaori, Pacific, and non-Maaori researchers and clinicians not involved in the day-to-day data collection. While a degree of overlap existed, as some Maaori researchers (AL, RC, HN) were involved in both analysis and the advisory group, this was a deliberate choice to maintain the "insider–outsider" balance that can be present for Kaupapa Maaori research (Tiakiwai, 2015).

Integrity was further safeguarded by ensuring that the non-Maaori and Pacific members (AA, SM, CB) provided an extra lens to the review. The CAAG role was to challenge the findings from clinical and cross-cultural perspectives, ensuring that the scientific accuracy of the T2D information remained robust. Such a multilayered governance model ensured that while the research remains community led, the intellectual outputs are validated through a process of rigorous analysis.

Phase 2: Development of the *tuna* framework. The insights gained from the initial community consultations shaped the development of the Ko Tuna Anahe framework, recognising the profound significance of *tuna* to the Waikato region (Waikato Raupatu River Trust, n.d.; Williams et al., 2019). Further, *tuna* holds deep cultural significance within Maaori cosmology, artistry, carvings, song, and traditional food-gathering practices (Williams et al., 2019). With the symbolic meaning of *tuna* in mind, the research team, in close collaboration with the community, adopted *tuna* as the central metaphor for this framework.

Drawing from the whakataukii "He ika paewai anake hei tomo ki roto te hiinaki (Only eels enter my basket)" our kaumaatua (TR) adapted this traditional wisdom to "Ko Tuna anahe ki taku hiinaki", which translates to "Tuna is the only one I would want in my eel-pot." The intentional use of "anahe" instead of "anake" reflects the Waikato dialect variation, thereby ensuring linguistic and cultural resonance for the community. Applying this dialectal adaptation moves beyond a general observation to a more specific and empowering statement about *tuna*, making it stronger and culturally affirming.

The whakataukii's focus on the hiinaki gave the foundational design for the framework because within this reflective metaphor, the hiinaki extends beyond its literal meaning of a net or pot to symbolise the physical body—the body representing a vessel for holistic health and well-being. Just as the hiinaki is carefully constructed to contain

FIGURE 1 Ko Tuna Anahe framework for developing culturally responsive T2D rauemi for Maaori communities (artwork created by Georgia Latu).

the valued *tuna*, so too must the physical body be nourished to achieve well-being. This relates back to T2D, for which healthy and nutrient-rich kai is beneficial in glycaemic management.

As shown in Figure 1, the pictorial framework is visually represented by two intertwined *tuna*, symbolising the intrinsic connection between the two main themes that emerged from the focus groups: maatauranga (the pursuit of knowledge, pono, and intergenerational knowledge transfer) and whaanau aspirations (cultural identity and whaanau-centred approaches). Each "fin" within this visual metaphor represents a subtheme, highlighting how the health goals and desires of whaanau are fundamentally grounded in ancestral wisdom and the reclamation of traditional knowledge. The cyclical design of the intertwined *tuna* further emphasises the inseparable and reciprocal relationship between maatauranga and whaanau aspirations in achieving holistic well-being.

The life cycle of the *tuna* is also represented in the design, in that many species of *tuna* in Aotearoa travel to breed in the Pacific (Williams et al., 2019) and return during adolescence and adulthood. Reflected within this migratory journey is the continuous pursuit of knowledge. The *tuna*'s movement towards survival mirrors the community's own efforts to seek and strengthen the wisdom needed for the long-term health of their whaanau.

This framework, deeply grounded in the wisdom of the whakataukii and the multifaceted symbolism of the hiinaki, served as the foundation for developing the culturally responsive educational resources.

Phase 3: Resource development guided by the Ko Tuna Anahe framework. With the Ko Tuna Anahe framework firmly established, the research team proceeded to develop the T2D educational resources: a dedicated website and a quote book. Kaupapa Maaori principles were applied throughout this development process to ensure the resources were culturally appropriate, accessible, and engaging for the target audience. Weaving te ao Maaori into the resources involved:

- integrating te reo Maaori into the resource content
- utilising culturally relevant imagery and design elements that resonated with Maaori identity
- featuring stories (lived experiences) and perspectives directly from Maaori community members to enhance authenticity, familiarity and relatability
- ensuring the resources explicitly aligned with Maaori cultural values and beliefs, providing a holistic and affirming approach to health
- incorporating maatauranga Maaori—with a webpage specifically dedicated to hauora, termed 'whaanau ora', where participants discussed cultural ways they used to ensure their well-being, such as whaanau, maara kai, karakia, and connecting with the awa and whenua. On this same page are links to traditional Waikato iwi waiata, karakia, and whaanau activity books.

The development of the resources was an iterative process, in which they were shaped and reshaped by the ongoing voices of the community. Frequent collaboration ensured the resources were not just a static product but a living reflection of the whanau's aspirations and lived realities.

Phase 4: Community feedback on developed resources. Once initial versions of the website and quote book were developed, they were taken back to the community for comprehensive feedback. Crucially, this phase is congruent with the participatory nature of Kaupapa Maaori research and ensured that the resources were validated by the community they were designed to serve. Feedback was systematically gathered through facilitated discussions with community members, usability testing of the website (observing how participants navigated and interacted with the platform) and detailed review of the content and design elements of both the website and the quote book.

Participants provided feedback on various aspects, including cultural relevance, clarity of information, accessibility (e.g., ease of use, language), and overall effectiveness in communicating T2D education.

Phase 5: Resource refinement and dissemination planning. The rich and constructive feedback received from the community during Phase 4 was carefully used to make necessary revisions and finalise both the website and the quote book. Integrating these insights ensured that the resources were co-created for maximum relevance. The dissemination plan, grounded in reciprocity and benefit-sharing, focused on providing the community with accessible and sustainable resources to ensure their impact and sustainability.

Results

Two sets of findings are presented here, first for the focus groups and second for community consultation on the resource developed.

Key themes from initial community consultation

Theme 1: Maatauranga—pursuit of knowledge, truth, and intergenerational knowledge. The overarching theme of maatauranga encompassed both general and Indigenous understandings of knowledge. Participants revealed substantial gaps in their initial T2D education and knowledge provided by healthcare professionals, leading to feelings of unpreparedness and distress. The existing information gap serves as a clear indicator of systemic failure within the clinical landscape. While participants expressed a strong, inherent desire for comprehensive T2D resources, the system's inability to provide accessible information on risk factors and management has created significant barriers to the health literacy and autonomy of participants. Grounded in the pursuit of knowledge was a profound commitment to pono (honesty and real-life relevance), alongside a recognition of the critical role of intergenerational knowledge transmission. This drive was further fuelled by a clear sense of responsibility towards future generations, particularly regarding T2D prevention.

Pursuit of knowledge: Participants frequently reported feeling ill-equipped for diabetes management, a direct consequence of inadequate information provided by the healthcare practitioner at the point of diagnosis. One participant highlighted this systemic gap, noting, "Because we have no knowledge. It's like, we didn't know, and we've had diabetes for one year." This structural suppression of information frequently resulted in profound feelings of helplessness and uncertainty; as another participant observed, "If you don't have that knowledge, you don't know."

This failure to provide accessible education generated significant emotional distress. One participant described the immediate existential fear following a diagnosis unsupported by clear guidance, stating, "And straight away in my head, I thought, I'm going to die." Such experiences reveal the extent to which clinical communication gaps exacerbate psychological burdens, highlighting a critical failure of care in T2D management.

Participants expressed a strong desire for proactive knowledge acquisition. One emphasised, "I want to know my risk. I want to know the symptoms. What we can do, where we can go." The drive to seek out information demonstrates a clear desire for self-determination; however, effective management remains dependent on a system that provides information in a way that is truly accessible and meaningful for whaanau.

Participants consistently reported that inadequate information provision by healthcare providers occurred particularly in primary care. One stated, "I don't think the doctors tell us much." Denying patients comprehensive information indicates a clear demand for improved patient education within primary care settings and stronger therapeutic relationships. Furthermore, participants stressed that clear and concise communication from medical providers, avoiding medical jargon, was essential for foundational education: "Yeah, so we have to pretty much start with the basics." Patient-centred relationships were also highly valued by participants, and face-to-face interactions were preferred: "Like, I know we can research and stuff, but that's not the same as sitting with people and talking it through with them."

Beyond face-to-face interactions, participants outlined the need for multiple learning modalities. While written materials are common, strong preferences for visual and audio formats were expressed: "Because some of our whaanau we see out of the community are illiterate ... but they can see a picture."

Pono: The value of real-life examples and potential consequences of suboptimal T2D care were strongly expressed. One participant commented on the effectiveness of a video depicting the challenges faced by someone who was not given the correct education at diagnosis, which resulted in dialysis, amputations, and blindness: "[The dialysis video] was a perfect example of not putting your health first, okay, yeah, the importance of diabetes if you don't look after it, if you don't act on it." The participant also stated, "I prefer messages like that, to be honest, so that we can take it more serious, like she didn't take it serious." Incorporating such real-life narratives and potential complications of T2D, akin to public health campaigns (e.g., historical quit smoking campaigns), was considered highly effective in motivating individuals to prioritise agency in their T2D care: "When I was growing up, smoking. They had real visual pictures on cigarette packets ... that scared me, like, I wouldn't do that, I don't want that to happen to me."

Intergenerational knowledge transmission: Intergenerational knowledge transmission holds profound significance in Maaori culture. Recognising the potential genetic predisposition to T2D within whaanau, participants emphasised the critical role of educating younger generations about prevention strategies. As one participant stated, "It can be stopped at a certain generation if the previous generation before does something

about it." Distributive responsibility in education was reiterated by another participant who stressed the importance of "sharing the information with the younger generation".

Early education interventions for tamariki were identified as a crucial component of diabetes prevention. One participant noted:

> If we were to start the education at kura and all that. So that when they're young, yeah, just cos obviously like it's hard as an adult to learn all these new ways of living and eating and all the stuff when you're so used to and stuck in your old ways. Whereas if you start as a kid. Yeah, it's a lot easier to learn or dive into it.

This insight emphasises the role of intergenerational knowledge transmission in building long-term metabolic resilience. By normalising health and well-being in childhood, whaanau are better prepared to navigate the structural barriers of a colonised food environment.

Participants also highlighted the significance of traditional Maaori dietary practices. One participant shared:

> Yeah, I think education around how our ancestors used to eat and stuff like that cos I think it was very different like obviously the impact of colonialism and stuff really that took a big shift in our people. And I think that will help our whaanau be more like kinder to ourselves, you know, like yeah just unpacking all the generational trauma and how we got to this point in kinda redirecting back to how our tuupuna used to live.

The detrimental impact of intergenerational trauma, land loss and structural dispossession highlights the need to address the historical and sociocultural factors contributing to current dietary patterns and their impact on diabetes risk.

Theme 2: Whaanau aspirations—cultural identity and whaanau-centred. Reflecting the core Maaori values of collectivism and interconnectedness, the theme of whaanau aspirations encompassed participants' hopes and expectations for T2D education. This included a strong desire for resources that affirm cultural identity and actively engage the entire whaanau in prevention and management.

Cultural identity: A significant subtheme emerged that emphasised the critical role of cultural expression in improving the accessibility and acceptability of diabetes education resources for Maaori. Participants strongly advocated for the integration of Maaori language and cultural values within these materials. For example, one participant highlighted the value of using familiar Maaori phrases, suggesting that "using familiar Maaori phrase or Maaori kupu" in diabetes educational materials would be helpful. Prioritising linguistic authenticity would foster a deeper sense of resonance. This approach not only would support Maaori identity but might encourage a wider uptake of te reo Maaori as a standard practice within health promotion and the broader community.

Representation within the resources was deemed paramount. Participants expressed a strong preference for educational materials that featured relatable characters and imagery. As one participant stated, "And even the characters like they look Maaori too, you know. It was real appealing [a video showing cartoons who were Maaori], cos it's like, I can see my whaanau."

Participants further accentuated the importance of integrating broader aspects of Maaori well-being, such as karakia and whakataukii, within educational materials. As one participant stated, "You gotta create something for Maaori, being able to add in karakia. Different whakataukii that are gonna encourage them to keep going." This integration would transform clinical resources into culturally meaningful tools, in which whakataukii act as a guiding force that links ancestral knowledge to current health aspirations.

Whaanau-centred: Within Maaori communities in Aotearoa, collectivism is a foundational value, with community and whaanau being paramount in individual well-being. Participant responses explicitly outlined the importance of cultural resonance within diabetes resources. One participant highlighted the significance of visual representation, stating, "A resource for our Maaori to catch their eyes? Ohhh that's about me, that's about my whanau." Such visual and relational affirmations foster an immediate sense of relevance, encouraging deeper engagement by mirroring the lived realities of whaanau.

Storytelling emerged as another crucial element to incorporate into T2D educational resources. Maaori are generationally oratory peoples, and as such, participants expressed a strong desire for video testimonies from individuals with lived experiences of diabetes. One participant stated, "You could also do a video of people with lived experiences ... what happened to them, how they got it, what works for them and what didn't work for them." A living testament of experiences would allow for vicarious learning, with familiar faces and local champions facilitating greater engagement.

The collectivist nature of Maaori society was further evident in the prominence participants placed on whaanau-centred education. Recognising that T2D has an impact on the entire whaanau, participants advocated for educational programmes that encompass the broader family unit. One participant called for "education, not only for the one that has the illness but for the person to listen like how you just share". Another participant stressed the importance of a "whole whaanau approach, not just a me approach". These perspectives highlight the demand for diabetes educational resources that acknowledge and support the interconnectedness of whaanau within te ao Maaori.

Community feedback on the developed resources

Following the development of the website and quote book guided by the Ko Tuna Anahe framework, these resources were presented back to the community for feedback, marking a critical step in the iterative PAR process. The feedback received was invaluable in refining the resources to truly meet community needs.

Website feedback: The community provided comprehensive feedback on the website, generally expressing high levels of satisfaction. Participants praised its usability, noting its intuitive navigation and design. The clarity of information was highlighted, with many appreciating the straightforward language that avoided medical jargon, making complex T2D concepts accessible. The cultural relevance of the visuals and language was particularly commended; participants expressed a strong sense of ownership and identity through the incorporation of te reo Maaori and Maaori faces, noting that the authentic design made the resource feel specifically intended for their whaanau. Specific comments highlighted the engaging nature of the content and the ease with which they could find information pertinent to their lives. For example, the interactive elements and short video clips were well received. Areas for minor improvement included suggestions for further expanding the range of personal stories and ensuring consistent mobile responsiveness across all devices, which were later addressed in the refinement phase.

Quote book feedback: The quote book also received positive feedback. Participants found the relevance and impact of the quotes to be powerful and motivating. The authentic voices and lived experiences shared within the book fostered a strong sense of connection and validation. The overall message of resilience, community support, and proactive health management was deeply appreciated. Many felt the book served as a source of inspiration and encouragement, making T2D management feel less isolating. Suggestions for improvement focused primarily on including quotes from a broader age range of individuals and potentially offering different formats (e.g., an audio version), which were considered for future iterations.

The community feedback led directly to several significant changes and improvements in both the website and the quote book. For instance, from feedback regarding mobile accessibility, the website was further optimised for smartphone viewing. Content on specific dietary approaches was expanded to include more traditional Maaori food options, reflecting a desire for practical, culturally aligned advice. The quote book saw a reordering of some quotes to create a more narrative flow, and a glossary of te reo Maaori terms was added to enhance accessibility for all users. A rigorous feedback loop ensured the final resources were robust, effective, and truly reflective of the community's aspirations.

Discussion

The significance of the key themes

The emergence of maatauranga and whaanau aspirations as core themes holds profound implications for developing effective and culturally responsive T2D education resources for Maaori.

Maatauranga extends beyond mere scientific facts, encompassing a holistic understanding of knowledge, its pursuit, and its intergenerational transmission (Broughton et al., 2015; Mercier, 2018). The community's strong desire for accessible, honest, and comprehensive T2D information highlights a critical gap in conventional health systems. Such feedback necessitates a shift towards resources that actively acknowledge existing anxieties and historical knowledge suppression while providing practical, culturally grounded insights. The emphasis on intergenerational knowledge further signals the importance of preventative education for tamariki and the reclamation of traditional Maaori dietary practices (e.g., maara kai, mahinga kai) as pathways to improved health outcomes. Centring these traditional practices allows for a decolonising approach to health education, one that recognises historical trauma while actively restoring Indigenous dietary knowledge (Cambie & Ferguson, 2003).

The principle of pono is a central component of tikanga, mandating transparency and integrity in communication (Mead, 2016). Grounded in this

ethical requirement, participants expressed a clear preference for pono, advocating for education that does not sanitise the clinical realities of T2D complications (Valenti, 2018). While the Ko Tuna Anahe framework is intentionally strength-based, it maintains conceptual precision by framing these realities within the context of agency. In this framework, the objective of T2D management is articulated as achieving metabolic stabilisation (Riddle et al., 2022). By providing whaanau with clinical facts regarding complications like diabetic nephropathy through a culturally safe lens, the framework empowers individuals to pursue long-term glycaemic stability and proactive health management, rather than reacting to deficit fear-based communication.

Whaanau aspirations powerfully encapsulates the collectivistic nature of Maaori society. The call for resources that affirm cultural identity, through the use of te reo Maaori, culturally representative imagery, and the integration of karakia and whakataukii, demonstrates that effective health education must resonate at an innate cultural level. The strong desire for whaanau-centred approaches, including storytelling and a focus on the broader family unit, challenges the individualistic focus often found in Western healthcare models (Reweti, 2023). Collective empowerment of the entire whaanau serves as the catalyst for sustainable health improvements, shifting the paradigm from an individualised approach towards a unified shared approach.

The tuna *as a cultural metaphor*

The adoption of the *tuna* as the central metaphor for the Ko Tuna Anahe framework demonstrates the efficacy of integrating local cultural symbols into healthcare. For Waikato, *tuna* represent more than sustenance; they embody resilience and ancestral connection (Waikato Raupatu River Trust, n.d.). By selecting a symbol with profound local significance, the framework allows abstract concepts of metabolic health to be tangible and culturally grounded (Takerei, 2019).

Crucially, the framework navigates the tension between critiquing structural drivers, such as land alienation, and the immediate demands of whaanau health management. We explicitly reframe medication and dietary adjustment not as Western "compliance", but as an exercise of mana motuhake. By reclaiming traditional dietary patterns, whaanau engage in a deliberate act of resistance against colonisation.

A unique contribution of this framework is the identification of a clinical-cultural synthesis regarding the *tuna*'s biochemical properties. The ancestral wisdom of *tuna* aligns with Western pharmacology because *tuna* contains peptides that inhibit the DPP-IV enzyme (Cao et al., 2023). These enzymes mirror the mechanism of pharmaceutical DPP-4 inhibitors used to enhance physiological insulin production (Cao et al., 2023; Doupis & Veves, 2008). This finding validates Indigenous ecological knowledge within the clinical environment (Standing & Kahu, 2021).

While the framework aligns with broader national and international Indigenous healthcare models such as Two-Eyed Seeing in Canada (Hovey et al., 2017) and Whaanau Ora in Aotearoa (Boulton & Gifford, 2014), comparison to the Pilinahā framework from Hawai'i is most fitting. Both are localised, community-born models that reject deficit-based labels in favour of connections to land and ancestral wisdom (Odom et al., 2019). The Ko Tuna Anahe framework proves that centring locally resonant symbols offers a transformative path for Indigenous health, ensuring interventions are grounded in the community's own identity, maatauranga, *and* scientific knowledge.

Implications for practice and policy

Interventions arising from this research should move beyond the traditional focus of individual lifestyle modifications. Instead, health promotion must be reframed as a process of cultural reclamation and structural navigation. Practitioners should support whaanau in identifying how historical factors have influenced their current health realities, allowing the management of T2D to be seen as a proactive restoration of ancestral well-being rather than an adherence to Western clinical objectives.

This research has significant implications for both health practice and policy, particularly concerning health education for Maaori and Indigenous populations. For health practitioners, it underscores the critical need to move beyond a one-size-fits-all approach to T2D education. It advocates patient-centred communication that is culturally safe, avoids jargon, and acknowledges the role of the whaanau. It highlights the value of incorporating diverse learning modalities and embracing authentic storytelling from lived experiences.

At a policy level, this study provides a robust evidence base for the strategic investment in community-led, Kaupapa Maaori approaches to health. Policies should actively support funding mechanisms and frameworks that empower Indigenous communities to define, design, and

deliver their own health solutions. Recognising and valuing Indigenous knowledge systems must be foundational to improve health outcomes. Integrating the principles of community consultation and cultural responsiveness into national health policy is essential for addressing pervasive health inequities and fostering mana motuhake in health service delivery. Ultimately, this research demonstrates that culturally responsive approaches are not just preferable; they are fundamental to achieving equitable and sustainable health outcomes for Maaori.

Strengths, limitations and future directions

The adoption of a PAR approach, underpinned by Kaupapa Maaori principles, proved to be a powerful and transformative methodology in this study that allowed for impactful and meaningful application. A primary strength was the inherent community ownership it fostered. By actively involving the community at every stage, from identifying needs to co-designing and refining resources, the process ensured that the outputs were not merely for them, but genuinely with and of them. Employing deep engagement directly enhanced the cultural relevance of the resources, moving beyond tokenistic inclusion to authentic integration of Maaori worldviews, language, and values. The iterative nature of PAR was also a significant benefit, allowing for continuous feedback and adaptive development, ensuring the resources remained responsive to evolving community needs and preferences. A flexible approach is crucial in complex health contexts.

However, PAR also presented challenges, as is typical for highly collaborative research. Managing diverse perspectives, coordinating multiple community members and researchers, and the significant time commitment required for genuine co-creation were all factors that demanded careful navigation. The whanaungatanga fostered through the process also built lasting relationships between the research team and the community, a reciprocal benefit inherent to Kaupapa Maaori research.

Limitations included the sample size of 11 participants. While sufficient for deep qualitative inquiry and achieving data saturation within a PAR framework, it represents a specific semi-rural Waikato Maaori community. The transferability of these findings to other Maaori communities throughout Aotearoa, or to other Indigenous populations, is limited without additional localised research in other geographic locations. Such limitations stem from the distinct cultural nuances between iwi and hapū, alongside variations in regional service delivery models. In addition, the perspectives of participants (age range 35–44) may differ from those of younger or older Maaori with T2D, although our projects local and university kaumaatua (TR) was included in the consultation and development stages.

Future research could explore the long-term impact and effectiveness of the Ko Tuna Anahe resources in terms of health behaviour change and clinical outcomes. Replication of this Kaupapa Maaori PAR approach with other chronic health conditions may further validate and refine the methodology. Investigating the most effective dissemination strategies for culturally responsive digital health resources within Maaori communities would also be a valuable area of inquiry. Additionally, exploring the perspectives of healthcare providers on integrating such culturally tailored resources into routine clinical practice could identify key facilitators and barriers to wider adoption.

Conclusion

This study successfully demonstrated the profound power of a Kaupapa Maaori PAR approach in collaboratively developing culturally responsive T2D educational resources for Maaori communities in the Waikato region. By deeply embedding community voices and Maaori cultural values throughout every phase of the research, our team and community created resources that were not only medically informative but also culturally affirming, accessible, and highly relevant to the lived experiences of whaanau.

The Ko Tuna Anahe framework demonstrates that T2D education for Maaori is most effective when it acknowledges the structural legacies of colonisation while simultaneously fostering individual and collective agency. Through positioning metabolic management as an act of mana motuhake, this ensures that the pursuit of well-being, and sustained glycaemic management, is inextricably linked to the reclamation of maatauranga Maaori and ancestral identity.

Acknowledgements

Throughout this article, the Waikato dialect's use of double vowels has been consistently employed in place of macrons. This linguistic choice reflects and honours the monumental role of the Waikato community in shaping this research, aligning with the principles of cultural responsiveness and local specificity. We extend our sincere gratitude to the participants from the Waikato community whose

invaluable insights, time, and trust were foundational to this research. Their willingness to share their experiences and co-create these resources is deeply appreciated. We also acknowledge the dedicated kaimahi at the community centre for their support and collaboration. We also wish to recognise the talent and impactful contributions of Georgia Latu, an emerging Maaori artist, in shaping our rangahau and framework design. Our sincere thanks also go to Professor Rose Richards for her invaluable expertise and meticulous review during the editing process. We acknowledge the assistance of Google Gemini 2.5, an AI model, for its support in spellchecking and reference verification. Funding was generously provided by the Health Research Council NZ, HRC#23/711.

Data Availability Statement

The online educational resource, Te Pou Whirinaki o te Mate Huka, developed through this research, is publicly accessible at www.matehuka.info.

Glossary

Aotearoa	New Zealand
awa	river
hapū	subtribe
hauora	holistic well-being, health
hiinaki	eel-pot or net
iwi	tribe
kai	food
kaimahi	worker, employee, clerk, staff
kaiwhakahaere	administrator, boss, director, organiser, manager
kanohi ki te kanohi	face-to-face
karakia	incantation, prayer, ritual chants; blessing
kaumaatua	elder
Kaupapa Maaori	a transformative paradigm rooted in Maaori worldviews and epistemologies, prioritising Maaori knowledge, perspectives, and self-determination; research conducted by, with, and for Maaori
koha	gift, show of appreciation, offering
kupu	word(s)
kura	school
Maaori	the Indigenous people of Aotearoa New Zealand
maara kai	gardens, food gardens
maatauranga	traditional Maaori knowledge, knowledge, wisdom, understanding, skill
mahinga kai	garden, cultivation, food-gathering place
mana	prestige, authority, control, power, influence, status
mana motuhake	self-determination, autonomy, agency
pono	honesty, truth, authenticity
rangahau tikanga	research protocols
rauemi	resource, teaching material
tamariki	children
te ao Maaori	Maaori worldview
Te Ara Tika	Health Research Council of New Zealand's ethical framework for Maaori health research
te reo Maaori	the Maaori language
tikanga	customs and practices
tuna	eel of various species
tuupuna	ancestors
waiata	song(s)
whaanau	extended family, family group, a familiar term of address to a number of people
whaanau ora	family health/well-being
whakapapa	genealogy, ancestry, familial relationships
whakataukii	ancestral knowledge and guidance, proverb, significant saying
whakawhanaungatanga	process of establishing relationships, relating well to others; relationship building
whenua	land, country

References

Bacal, K., & Jansen, P. (2006). *Best health outcomes for Māori: Practice implications*. Medical Council of New Zealand. https://www.indigenouspsych.org/Resources/Best_Health_Outcomes_for_Maori.pdf

Boulton, A., & Gifford, H. (2014). Conceptualising the link between resilience and whānau ora. *MAI Journal*, *3*(2), 111–125. https://www.journal.mai.ac.nz/system/files/MAI_Jrnl_V3_iss2_Boulton.pdf

Broughton, D., McBreen, K., Waitaha, K. M., & Tahu, N. (2015). Mātauranga Māori, tino rangatiratanga and the future of New Zealand science. *Journal of the Royal Society of New Zealand*, *45*(2), 83–88. https://doi.org/gjt5ck

Cambie, R. C., & Ferguson, L. R. (2003). Potential functional foods in the traditional Maori diet. *Mutation Research/Fundamental and Molecular Mechanisms of Mutagenesis*, *523–524*, 109–117. https://doi.org/bsbd5s

Cao, H., Di, N., Jiang, B., Chen, J., & Zhang, T. (2023). Purification and characterization of the dipeptidyl peptidase-IV inhibitory peptides from eel (*Anguilla rostrata*) scraps enzymatic hydrolysate for the treatment of type 2 diabetes mellitus. *Journal of the Science of Food and Agriculture*, *103*(7), 3714–3724. https://doi.org/g4r3pt

Chepulis, L., Morison, B., Cassim, S., Norman, K., Keenan, R., Paul, R., & Lawrenson, R. (2021). Barriers to diabetes self-management in a subset of New Zealand adults with type 2 diabetes and poor glycaemic control. *Journal of Diabetes Research*, *2021*, Article 5531146. https://doi.org/g8qgr6

Cornish, F., Breton, N., Moreno-Tabarez, U., Delgado, J., Rua, M., de-Graft Aikins, A., & Hodgetts, D. (2023). Participatory action research. *Nature Reviews Methods Primers*, *3*(1), Article 34. https://doi.org/gtj9xw

Crosswell, R., Norman, K., Cassim, S., Papa, V., Keenan, R., Paul, R., & Chepulis, L. (2024). Are patients with type 2 diabetes in the Waikato District provided with adequate education and support in primary care to self-manage their condition? A qualitative study. *Journal of Primary Health Care*, *16*(1), 61–69. https://doi.org/q4c3

Curtis, E., Harris, R., McLeod, M., Mills, C., Scott, N., & Reid, P. (2022). *Māori health priorities: A report commissioned by the interim Māori Health Authority (iMHA) to inform development of the interim New Zealand Health Plan (iNZHP)*. Te Aka Whai Ora. https://researchspace.auckland.ac.nz/items/c1048913-5a29-482f-a535-8925c86a8984

Diabetes New Zealand. (2024). *Our research*. https://www.diabetes.org.nz/our-research

Dobson, R., Carter, K., Cutfield, R., Hulme, A., Hulme, R., McNamara, C., Maddison, R., Murphy, R., Shepherd, M., & Strydom, J. (2015). Diabetes text-message self-management support programme (SMS4BG): A pilot study. *JMIR mHealth and uHealth*, *3*(1), Article e32. https://doi.org/q4c6

Doupis, J., & Veves, A. (2008). DPP4 inhibitors: A new approach in diabetes treatment. *Advances in Therapy*, *25*, 627–643. https://doi.org/cwj46g

Eruera, M. (2010). Ma te whānau te huarahi motuhake: Whānau participatory action research groups. *MAI Review*, (3). https://www.journal.mai.ac.nz/system/files/maireview/393-2862-1-PB.pdf

Farmer, A., Gage, J., Kirk, R., & Edgar, T. (2016). Applying community-based participatory research to create a diabetes prevention documentary with New Zealand Māori. *Progress in Community Health Partnerships*, *10*(3), 383–390. https://doi.org/f89zhw

Hovey, R. B., Delormier, T., McComber, A. M., Lévesque, L., & Martin, D. (2017). Enhancing Indigenous health promotion research through Two-Eyed Seeing: A hermeneutic relational process. *Qualitative Health Research*, *27*(9), 1278–1287. https://doi.org/gbmp5c

Hudson, M., Milne, M., Reynolds, P., Russell, K., & Smith, B. (2010). *Te Ara Tika: Guidelines for Māori research ethics: A framework for researchers and ethics committee members*. Health Research Council of New Zealand. https://www.hrc.govt.nz/resources/te-ara-tika-guidelines-maori-research-ethics-0

Hyett, S. L., Gabel, C., Marjerrison, S., & Schwartz, L. (2019). Deficit-based Indigenous health research and the stereotyping of Indigenous Peoples. *Canadian Journal of Bioethics*, *2*(2), 102–109. https://doi.org/dv3n

Jansen, P., Bacal, K., & Buetow, S. (2011). A comparison of Māori and non-Māori experiences of general practice. *New Zealand Medical Journal*, *124*(1330), 24–29. https://nzmj.org.nz/media/pages/journal/vol-124-no-1330/a-comparison-of-maori-and-non-maori-experiences-of-general-practice/e4d609a74c-1696472241/a-comparison-of-maori-and-non-maori-experiences-of-general-practice.pdf

Krebs, J. D., Parry-Strong, A., Gamble, E., McBain, L., Bingham, L. J., Dutton, E. S., Tapu-Ta'ala, S., Howells, J., Metekingi, H., & Smith, R. B. W. (2013). A structured, group-based diabetes self-management education (DSME) programme for people, families and whanau with type 2 diabetes (T2DM) in New Zealand: An observational study. *Primary Care Diabetes*, *7*(2), 151–158. https://doi.org/f2mxkr

Lewis, M. E., Volpert-Esmond, H. I., Deen, J. F., Modde, E., & Warne, D. (2021). Stress and cardiometabolic disease risk for Indigenous populations throughout the lifespan. *International Journal of Environmental Research and Public Health*, *18*(4), Article 1821. https://doi.org/gjp7rz

Lovett, R., Lee, V., Kukutai, T., Cormack, D., Rainie, S., & Walker, J. (2019). Good data practices for indigenous data sovereignty and governance. In A. Daly, S. K. Devitt, & M. Mann (Eds.), *Good Data* (Vol. 1, pp. 26–36). Institute of Network Cultures.

Mead, H. M. (2016). *Tikanga Māori: Living by Māori values* (Rev. ed.). Huia Publishers.

Mercier, O. (2018). Mātauranga and science. *New Zealand Science Review*, *74*(4), 83–90. https://doi.org/mxmb

Ministry of Health. (2022). *Diabetes data and statistics, 2024*. https://www.health.govt.nz/monitoring-statistics/statistics-and-data-sets/diabetes

Ministry of Health. (2023). *Tatau Kahukura: Māori Health Chart Book 2024*. https://www.health.govt.nz/publications/tatau-kahukura-maori-health-chart-book-2024

Moewaka Barnes, H., & McCreanor, T. (2019). Colonisation, hauora and whenua in Aotearoa. *Journal of the Royal Society of New Zealand*, *49*(Suppl. 1), 19–33. https://doi.org/d23v

Naderifar, M., Goli, H., & Ghaljaie, F. (2017). Snowball sampling: A purposeful method of sampling in qualitative research. *Strides in Development of Medical Education*, *14*(3), Article e67670. https://doi.org/d5nd

Odom, S. K., Jackson, P., Derauf, D., Inada, M. K., & Aoki, A. H. (2019). Pilinahā: An indigenous

framework for health. *Current Developments in Nutrition*, *3*(Suppl. 2), 32–38. https://doi.org/gjnv3w

Olokoba, A. B., Obateru, O. A., & Olokoba, L. B. (2012). Type 2 diabetes mellitus: A review of current trends. *Oman Medical Journal*, *27*(4), 269–273. https://doi.org/gjn5mn

Pouwhare, R. (2016). Kai hea kai hea te pū o te mate? Reclaiming the power of pūrākau. *Te Kaharoa*, 9(1). https://doi.org/pdxr

Powers, M. A., Bardsley, J., Cypress, M., Duker, P., Funnell, M. M., Fischl, A. H., Maryniuk, M. D., Siminerio, L., & Vivian, E. (2017). Diabetes self-management education and support in type 2 diabetes: A joint position statement. *The Diabetes Educator*, *43*(1), 40–53. https://doi.org/ghc24t

Reweti, A. (2023). Understanding how whānau-centred initiatives can improve Māori health in Aotearoa New Zealand. *Health Promotion International*, *38*(4), Article daad070. https://doi.org/q4dk

Riddle, M. C., Cefalu, W. T., Evans, P. H., Gerstein, H. C., Nauck, M. A., Oh, W. K., Rothberg, A. E., le Roux, C. W., Rubino, F., & Schauer, P. (2022). Consensus report: Definition and interpretation of remission in type 2 diabetes. *The Journal of Clinical Endocrinology & Metabolism*, *107*(1), 1–9. https://doi.org/g4jb

Smith, L. T. (2017). Towards developing indigenous methodologies: Kaupapa Māori research. In T. K. Hoskins & A. Jones (Eds.), *Critical Conversations in Kaupapa Māori* (pp. 183–199). Huia Publishers.

Standing, M., & Kahu, E. R. (2021). Story, myth, and pūrākau: An exploration of the use of narrative in the therapeutic setting in Aotearoa New Zealand. *New Zealand Journal of Psychology*, *50*(3), 29–38. https://www.psychology.org.nz/application/files/2416/4021/0953/Standing_29-38.pdf

Świątoniowska, N., Sarzyńska, K., Szymańska-Chabowska, A., & Jankowska-Polańska, B. (2019). The role of education in type 2 diabetes treatment. *Diabetes Research and Clinical Practice*, *151*, 237–246. https://doi.org/gpw2qg

Takerei, M. R. T. (2019). *Tūrangawaewae mō te Kiingitanga* [Master's thesis, University of Waikato]. Research Commons. https://hdl.handle.net/10289/13041

Te Mana Raraunga: Māori Data Sovereignty Network. (2023). *Our data, our sovereignty, our future*. https://www.temanararaunga.maori.nz/

Tiakiwai, S. J. (2015). Understanding and doing research: A Māori position. In L. Pihama, S.-J. Tiakiwai, & K. Southey (Eds.), *Kaupapa rangahau: A reader* (pp. 77–93). Te Matenga Punenga o Te Kotahi, Te Whare Wānanga o Waikato; Waikato-Tainui College for Research and Development; Ngā Pae o te Māramatanga.

Tipene-Leach, D. C., Coppell, K. J., Abel, S., Pāhau, H. L., Ehau, T., & Mann, J. I. (2013). Ngāti and healthy: Translating diabetes prevention evidence into community action. *Ethnicity & Health*, *18*(4), 402–414. https://doi.org/q4dn

Valenti, T. (2018). *Flip it around! To being a good reminder on how you're supposed to live: Understanding the role of storytelling as a means of encouraging compassionate listening in type 2 diabetes healthcare settings* [Master's thesis, Laurentian University of Sudbury]. LU|ZONE|UL. https://laurentian.scholaris.ca/handle/10219/3120

van Dieren, S., Beulens, J. W. J., van der Schouw, Y. T., Grobbee, D. E., & Neal, B. (2010). The global burden of diabetes and its complications: An emerging pandemic. *European Journal of Cardiovascular Prevention & Rehabilitation*, *17*(1_suppl), s3–s8. https://doi.org/dxcqw2

Waikato Raupatu River Trust. (n.d.). *Waikato—Waipa fisheries taonga: Fisheries taonga have sustained our people for centuries*. Waikato Regional Council. https://www.waikatoregion.govt.nz/assets/WRC/HR/6/107-3168015.pdf

Waikato Tainui. (n.d.). *Kiingitanga*. https://waikatotainui.com/about-us/kiingitanga/

Williams, E., Zernack, A., Boubée, J., & Watene, E. (2019). New Zealand tuna (freshwater eels): Māori-driven management practices—past, present and future. In A. Don & P. Coulson (Eds.), *Eels biology, monitoring, management, culture and exploitation: Proceedings of the first international eel science symposium* (pp. 210–217). 5m Publishing Ltd. https://doi.org/q4dp