Where Confidence Fails, Training Prevails: Effects of Behavioural Skills Training on Improving Kaimahi Confidence When Using Patient Management Systems for Outreach Immunisation Services.

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Abstract

In New Zealand, immunisation rates among tamariki Māori are consistently lower nationally at all recommended age milestones. Access to clear and timely information can facilitate engagement with whānau Māori. This study evaluated the effectiveness of Behavioural skills training (BST) to improve kaimahi use of a patient management system (PMS) – Indici. A Kaupapa Māori approach was utilised to engage with the organisation. Seven participants were recruited from a local health and social services provider. Consultation supported development of task analyses used for training. BST occurs in four phases: instruction, modelling, rehearsal, and feedback. Data were collected following a multiple baseline design with a single baseline session, BST intervention, and a follow-up session to assess for maintenance. All participants demonstrated improvement in task accuracy following the introduction of BST and maintained task accuracy in a post-training follow-up. Despite improvements across all participants, task adherence was impacted during training. This study highlights that BST is an effective, socially valid tool for training simple skills for accessing information in a PMS such as Indici. However, further research is needed to examine the use of BST for teaching complex computer systems in applied health settings.

Keywords: behavioural skill training, task analysis, patient management system, co-design, kaupapa Māori

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Glossary of terms

Term	Definition
Aotearoa	New Zealand
Aroha ki te tangata	Love, respect, and compassion for the people. Treat people with dignity and care
Hapū Māmā	Pregnant mother
Hauora	Holistic health encompassing physical, emotional, spiritual, and social wellbeing
Hui	Meeting
Iwi	Tribe or tribal collective.
Kahu Taurima	Free advocacy and support for whānau from pregnancy through to early childhood
Kaiāwhina	Advocate, helper
Kaimahi	Staff, employee
Kaitataki	Team Leader
Kaitiaki	Guardian
Kaitohutohu	Guidance counsellor or support person,
Kanohi Kitea	Cultural practice known as 'the seen face'. A person recognised in their community as someone who is always available or present at important kaupapa in the community
Karakia	to recite ritual chants, say grace, pray, recite a prayer, chant.
Kaupapa	Topic, programme, issue
Kaupapa Māori	Research or practice grounded in Māori ways of knowing, Māori values, and Māori aspirations
Kaupapa Māori co-design approach	A collaborative approach rooted in Māori values, prioritising Māori knowledge, relationships, and collective decision-making
Koha	Gift, present, offering, donation, contribution

Māori	Indigenous person/peoples of Aotearoa/New Zealand, apply in a Māori way
Manaaki	To support, care for, or show kindness
Manaakitanga / Manaaki	Hospitality, kindness, generosity, support
Mana Motuhake	Autonomy, independence
Maramatanga	Understanding
Mātauranga Māori	Māori knowledge systems and epistemology; ways of understanding grounded in te ao Māori
Pēpi	Baby, toddler
Rohe	Region
Tamaiti	Child
Tamariki	Children
Tamariki Māori	Māori children
Tautoko	To support, advocate
Te Whāriki Aroha	Tūwharetoa Health shared office locality
Teina	Younger sibling of the same gender, junior peer mentor
Tikanga	Māori customs, correct procedures, and cultural protocols guiding behaviour
Titiro, whakaronga, kōrero	Observe, listen, and then speak. A kaupapa Māori research principle
Tuakana	Elder sibling of the same gender, senior peer mentor
Whaiora	Patient
Whakawhanaungatanga	Process of establishing relationships, relating well to others.
Whanaungatanga	The process of actively establishing and strengthening relationships
Whānau	Family, extended family, a familiar term of address to a number of people
Whānau māori	Māori families
Whare	Home, shared community space

Where Confidence Fails, Training Prevails: Effects of Behavioural Skills Training on Improving Kaimahi Confidence When Using Patient Management Systems for Outreach Immunisation Services.

Throughout history, human populations have experienced high mortality as a result of infectious diseases (Bavel et al., 2020). With the development of vaccinations in the late 1700s (Amanna & Slifka, 2018) millions of deaths have been prevented through public health immunisation campaigns (World Health Organization, 2024). When public health strategies are coordinated, clearly communicated, and implemented effectively, the spread and prevalence of infectious diseases can be contained or eradicated from communities (World Health Organization, 2024). Service improvements and workforce development contribute to the success of vaccine and immunisation programmes in managing disease outbreaks (Iglesias Sigüenza et al., 2025). Effective management of outbreaks such as measles, pertussis (whooping cough), poliomyelitis (polio), and Ebola has reduced deaths in mainstream populations and has been particularly important for vulnerable and Indigenous communities (Amanna & Slifka, 2018). Despite these advances, Indigenous peoples continue to experience low immunisation uptake compared to non-Indigenous populations (Menzies & McIntyre, 2006).

In 1974, the Expanded Programme on Immunisation (EPI) was launched to provide all children access to life-saving vaccines (Ruff, 1999; World Health Organization, 2024). Global agencies such as the World Health Organization (WHO), Global Alliance for Vaccines and Immunisation (GAVI), and the World Federation of Public Health Associations (WFPHA) have developed global policy and strategy recommendations to guide a coordinated national response (Immunisation Agenda, 2030). In many developing countries, national

immunisation campaigns have offered a cost-effective public health response that has saved millions of children's lives (Grant et al., 2010). Prior to the launch of the EPI, global immunisation coverage for children was approximately 5% worldwide (Greenwood, 2014; Ruff, 1999). By the 1990s, 90% of children had received immunisations against tuberculosis (BCG), and 75%-80% had been vaccinated against diphtheria, tetanus, whooping cough, polio, and measles (Ruff, 1999).

To protect children and other vulnerable communities, the WHO set a global target of 95% of children to be fully immunised by the age of five (World Health Organization, 2024). Achieving this target aims to prevent further outbreaks of vaccine preventable diseases (VPDs) (Ministry of Health [Manatū Hauora], 2007; World Health Organization, 2024). However, despite early successes, rates of engagement with immunisation campaigns remains poor in Indigenous communities (Menzies & McIntyre, 2006). This pattern has been documented among Native Americans in the United States, Aboriginal and Torres Strait peoples in Australia, and First Nations peoples of Canada (Galadima et al., 2022; Menzies & McIntyre, 2006). Māori in Aotearoa, New Zealand (NZ) also experience lower immunisation rates with inequities widening post the COVID-19 pandemic (Chan et al., 2024; Iglesias Sigüenza et al., 2025; Menzies & McIntyre, 2006; Ministry of Health [Manatū Hauora], 2007).

One key factor underlying these inequities relates to the historical and ongoing impacts of colonisation and associated grievances experienced by Indigenous peoples which have contributed to disengagement from public health interventions such as immunisation campaigns (Bavel et al., 2020). In Aotearoa NZ, efforts to achieve the WHO target for childhood immunisation have not been realised and coverage continues to fall behind across all ethnic groups (Ministry of Health, 2007). National data highlights persistent

inequities for tamariki Māori, who have lower immunisation rates than non-Māori children (48.6% Māori compared to 67.9% total population). Tamariki Māori are consistently below non-Māori at all recommended age milestones across every region in Aotearoa NZ (Te Whatu Ora [Health New Zealand], 2025). Working with whānau Māori in their own communities is therefore an important approach to understand how to enhance access to health services and identify where community interventions and behaviour change can occur (Kidd et al., 2021).

The impacts of colonisation continue to shape how Māori communities engage with the health system (Maree Kopua et al., 2020). Experiences of racism and prejudice in health settings are well documented, and these experiences contribute to mistrust and disconnection (Bavel et al., 2020; Menzies & McIntyre, 2006; Mutu, 2019). Where health services are committed to honouring Te Tiriti o Waitangi, they are more able to deliver care that creates time and space for authentic whakawhanaungatanga. When whānau Māori experience reciprocal relationships with health providers, a safe and trusting environment is created and meaningful engagement becomes more likely (Carlson et al., 2016; Espiner et al., 2021). In contrast, when health services minimise, overlook, or devalue Māori worldviews and interpretations of health, whānau report feeling unheard and disrespected (Abraham et al., 2018).

The erosion of trust seen in the NZ health sector has been gradual and cumulative (Carlson, 2016). Although mainstream media often portrays vaccine hesitancy concern as being related to the speed of vaccine development, emerging research suggests this is not the primary driver of reduced engagement for Māori (Chan et al., 2024). Rather, many Māori communities have historically disengaged because of a lack of trust in the health system as a whole (Abraham et al., 2018). Abraham et al. (2018) found that Māori health

users' understandings of their health were frequently disregarded in clinical decision-making, indicating that Māori rights and perspectives were not being respected. Where high rates of engagement were observed, whakawhawhanaungatanga was central to building trust and supporting participation, whereas poor communication and lack of access to meaningful information remained a persistent barrier (Espiner et al., 2021).

Abraham et al. (2018, 2023) also report that whānau Māori want clear, simple, and accessible information from their health care providers (HCPs) and hauora Māori (HM) services. For meaningful engagement and informed decision making, health practitioners (HPs) and kaimahi must build authentic relationships while ensuring that information is understandable, timely, and relevant (Abraham et al., 2023). One important tool to support this work is the patient management system (PMS), a secure database that hold patient information. PMS platforms, such as Indici pre-populate key dates that indicate when whaiora should be contacted for important health engagements, including immunisations. Indici also pre-populates engagement dates that align age-based milestones in the National Immunisation Schedule (NIS), providing a structured guide to immunisation timetables. When HPs and kaimahi have the skills needed to use PMS effectively, they retrieve relevant information and communicate with whānau and their communities (Alquran et al., 2024).

As technology becomes more integrated into the health sector, the expectations on HPs and kaimahi to engage with digital systems will continue to increase (Cavanagh et al., 2022). Health workers will be required to develop and maintain digital skills alongside clinical competencies. For kaimahi new to the workforce and those with decades of experience, it is important that training and support enable them to feel confident and competent in using health technologies such as PMS. Where technologies are introduced without adequate

training and support, staff may lack the required skills and subsequently avoid using these systems (Borges do Nascimento et al., 2023).

In Aotearoa NZ, Outreach Immunisation Services (OIS) have been established to provide flexible, community-based immunisation support and increase access for tamariki and whānau (Te Whatu Ora, 2023). OIS can deliver immunisations in homes and community settings and are intended to empower whānau to make informed decisions. In provincial and rural communities, multiple OIS teams may operate across the same rohe, sometimes supporting the same whānau in parallel. Without effective communication and information sharing between services, whānau may receive multiple, sometimes conflicting messages and appointment times. This can cause confusion, place additional duplication of effort, and increase the risk that pēpi and tamariki receive immunisations at incorrect times, reducing vaccine effectiveness and undermining trust (Te Whatu Ora, 2023). To support whānau to receive timely immunisations with the NIS, to minimise duplication and error, and ensure tamariki are receiving immunisations in alignment with the NIS, OIS must be underpinned by accurate, coordinated use of PMS such as Indici (Immunisation Advisory Centre, 2025; Te Whatu Ora, 2023). This requires HPs and kaimahi to be able to locate, interpret, and act on immunisation information for pēpi and tamariki within PMS. Workforce development that focuses on digital skill acquisition is therefore critical, particularly in a hauora Māori setting, where services are often leading innovative responses to immunisation inequalities (Kidd et al., 2021; Rolleston et al., 2022; Te Whatu Ora, 2025).

One field that offers structured methods for supporting skill development in the workplace is behaviour analysis (BA), a branch of psychology grounded in empirical science and data-driven approaches (Cooper et al., 2019; Skinner, 1965). BA examines functional relations between behaviour and environment variables, focussing on the contingencies

under which behaviours occur and are maintained (Rasmussen et al., 2022). By modifying contingencies in the environment, BA aims to change the likelihood a particular behaviour will occur in the future under similar conditions (Skinner, 1965). BA considers the role of consequences that may encourage (reinforce) or discourage (punish) behaviour, the stimuli that signal when a response is likely (discriminative stimuli or S^D) and the extent to which behaviours generalise across contexts. These concepts and principles have been applied across health and community settings, including smoking cessation (e.g., Dallery & Raiff, 2011), dental hygiene programmes (e.g., Lang et al., 2013), and toilet training interventions (e.g., Azrin & Foxx, 1989).

BA has also demonstrated effectiveness in supporting workforce training and skill acquisition (Vanselow & Hanley, 2014). Behavioural skills training (BST) is one of the most widely used and evidence-base BA training packages. BST typically consists of four components: instruction, modelling, rehearsal, and feedback, delivered in relation to a clearly defined task analysis (a breakdown of a task into smaller steps) for the target skill (Vanselow & Hanley, 2014). BST has been implemented across a range of settings and behaviours, including teaching youth soccer players safe heading techniques (Quintero et al., 2020), and training health professionals to use BST with students who have intellectual disabilities (Parsons, 2013). More recently, BST has also been delivered via telehealth to large groups of participants, further demonstrating its flexibility and potential for use in health contexts (Decarli, 2021).

In computer-based workforce development, BST has been used to teach basic computer skills to young adults with autism to support employment (Sump et al., 2019). Dotson et al. (2013) used BST with participants diagnosed with developmental disabilities to build computer skills required to operate a small business. However, these studies

emphasised basic computer operations (for example, logging on, opening programmes, naming, and saving documents) and did not examine complex, domain-specific systems such as PMS. There is limited evidence regarding the application of BST with non-developmental disability (non-DD) populations in health workplaces, particularly with kaimahi employed by HCPS or HM services who must use PMS as part of their everyday practice. This identifies a clear gap in the literature at the intersection of BA, digital skill development, and Indigenous health service contexts.

Although BA recognises that cultural practices contribute to the maintenance of behaviour over time, it has not consistently incorporated a strong cultural lens (Beaulieu & Jimenez-Gomez, 2022). For Indigenous communities, including Māori, this presents ethical and practical challenges. BA remains largely grounded in Western scientific paradigms and relies on individual practitioners to engage in a culturally responsive manner (Jimenez-Gomez & Beaulieu, 2022). In Aotearoa NZ, the code of ethics for behaviour analysts emphasises respect, compassion and collaboration, showing aroha and manaakitanga, and honouring the dignity of every person (Society for Behaviour Analysis Aotearoa New Zealand, 2025). These values align closely with kaupapa Māori (KM) principles and create a foundation for more culturally congruent practice when BA is intentionally integrated with KM approaches (Kidd et al., 2021; Rolleston et al., 2022).

A KM co-design approach provides a framework for engaging with Māori communities that centres whānau aspirations, challenges existing power dynamics, and attends to wider system and organisation structures (Goodwin & Boulton, 2024; Kidd et al., 2021). Co-design is a key element of KM as it acknowledges that communities hold expertise about their own realities and should shape the design, implementation, and evaluation of health services (Goodwin & Boulton, 2024; Rolleston et al., 2022). KM approaches, like BA,

interrogate environments and systems to understand where change is possible, but KM foregrounds Māori worldviews, mātauranga, and collective decision making (Carlson, 2019; Kidd et al., 2021). In this way, KM approaches can guide the culturally safe application of BA technologies such BST within Hauora Māori settings.

Integrating BA and KM offers the potential to develop training interventions that are both empirically robust and culturally grounded. Behaviour analysis can contribute to precise methods for identifying skill deficits, analysing demands, and designing training packages, while KM ensures that research is by Māori, and for Māori (Kidd et al., 2021; Rolleston et al., 2022). In the context of immunisation, this integration supports the development of training that not only improves kaimahi use of PMS but also aligns with kaupapa such as mana motuhake, whanaungatanga, and Manaaki in relationships with whānau.

As the reliance on technology in the health sector grows, ensuring that kaimahi and HPs have the skills to navigate PMS such as Indici is increasingly important for improving immunisation engagement with whānau Māori (Alquran et al., 2024; Cavanagh et al., 2022). When staff have low confidence or limited experience with key technologies, structured workplace training is recommended. Addressing this gap is critical in light of ongoing immunisation inequities for tamariki Māori and the central role of hauora Māori providers leading innovative, community driven responses (Immunising our Tamariki Programme, 2025; Te Whatu Ora, 2025). This study aimed to explore the effectiveness of a BST programme, underpinned by a kaupapa Māori co-design approach, to increase PMS-related computer skills among kaimahi employed by a Māori health provider, Tūwharetoa Health Charitable Trust (Tūwharetoa Health). It was hypothesised that BST, when embedded within a KM approach, would support kaimahi to develop and sustain the skills needed to navigate

Indici, improve coordination of immunisation-related communication, and contribute to increased immunisation engagement with whānau Māori.

Method

This chapter outlines the methodological framework for the study, detailing how kaupapa Māori principles informed every stage of the research design and implementation. It begins by describing the kaupapa Māori research approach and consultation process with Tūwharetoa Health, before setting out the recruitment of kaimahi, ethical approvals, and the koha practices used to uphold manaakitanga. The chapter then introduces the intervention, participants, settings, materials (including Indici and the task analyses), and concludes with an account of data collection and management procedures.

Kaupapa Māori Research

Kaupapa Māori research positions being Māori, mātauranga Māori and tikanga as the normative basis for inquiry, affirming the validity of Māori ways of knowing and resisting deficit or colonising framings (Nepe, 1991; Smith, 1997) It is underpinned by tino rangatiratanga and mana motuhake, requiring Māori control over research questions, processes and outcomes, and a clear commitment to transformative benefits for Māori communities (Bishop, 1996; Cram, 2001). This approach is particularly important in health research, where kaupapa Māori methodologies help redress historical harms, rebuild trust, and ensure that evidence supports Māori aspirations for ora rather than reproducing inequities (Ormond, et al., 2006; Smith, 2012; Tipa, 2019).

This research was intentionally designed as a values-based kaupapa Māori project, grounded in Linda Tuhiwai Smith's decolonising research principles of aroha ki te tangata, titiro, whakaronga, kōrero, and whakawhanaungatanga (Smith, 2012). Aroha ki te tangata guided a deep respect for kaimahi and whānau, including their right to shape the research

context, pace, and priorities; titiro, whakaronga, kōrero required the researcher to first observe and listen, then speak; and whakawhanaungatanga underpinned a commitment to genuine, enduring relationships rather than extractive data collection (Smith, 2012; Rewi, 2010). From the outset, the topic, focus area, scope, and level of intervention were developed in alignment with the strategic priorities of Tūwharetoa Health, reflecting accountable research that is by, with, and for the provider and its communities (Pipi et al., 2013; Ormand, et.al., 2006).

Kaupapa Māori Consultation Process

The consultation process began with Tūwharetoa Health in October 2024 and extended over approximately 12 months, from first kōrero to the commencement of participant recruitment. This timeframe reflected a commitment to whakawhanaungatanga, organisational maramatanga, and the practice of kanohi kitea within the provider (O'Carroll, 2013; Pipi et al., 2002; Smith, 2012). Time was treated as an essential condition for building meaningful, authentic relationships with whānau and kaimahi, consistent with kaupapa Māori methodologies and prioritising trust, reciprocity, and collective benefit over speed or convenience (Kidd et al., 2021; Rewi, 2014).

This work was situated within an inequitable Western health system in which iwi and Māori providers operate under heightened scrutiny, unique workforce pressures, and competitive contracting environments that can position them in direct competition with mainstream organisations (Pipi et al., 2002). These conditions influenced the research design, timing, and implementation, including the need to minimise disruption to service delivery, respect existing reporting pressures, and recognise the political and economic context in which kaimahi work (Smith, 2012). As a Māori researcher and kaimahi, I occupied both insider and outsider positions, sharing whakapapa connections, language, and

professional realities with participants, while also being a university-based student researcher, requiring ongoing reflexivity about power, accountability, and positionality (Rewi, 2014; Smith, 2012).

To reduce any sense of coercion, kaitataki introduced the research to their teams, explained the kaupapa, and asked kaimahi whether they wished to be involved. This process upheld aroha ki te tangata by ensuring participation was voluntary and led from within the organisation rather than imposed externally (Cram, 2001; Smith, 2012). Kaitataki could request a research information pack so they could distribute it to their teams, aligning with titiro, whakarongo, kōrero by allowing time for internal discussion before formal consent was sought. The information pack included a study information sheet for kaimahi see Appendix A, a consent form for contact by the university researcher see Appendix B, a study consent form for participants see Appendix C, and a pre-training questionnaire see Appendix D.

Kaimahi who wished to participate registered their interest with their kaitataki and provided initial permission to be contacted. The Lead researcher then followed up either kanohi ki te kanohi or via email to arrange an information hui, in line with the emphasis on being a seen and accountable face within kaupapa Māori research (O'Carroll, 2013; Pipi et al., 2002). All participants were offered an electronic copy of the full ethics application so they could review the wider context, safeguards, and university requirements before deciding whether to proceed. Kaimahi were asked to complete consent forms within 10 days and to return them in sealed envelopes to the administration team, ensuring privacy and minimising any pressure from the researcher or managers.

The Lead researcher collected the sealed envelopes at the end of the day (or earlier if requested) and scanned them into a secure University of Waikato OneDrive account, in line with institutional data management procedures. Participants were informed that all

hardcopy documents would be destroyed at the conclusion of the project, consistent with ethical guidelines and kaupapa Māori commitments to protect mana and confidentiality (Smith, 2012; Health and Disability Ethics Committees, 2022). Each kaimahi was allocated a participant identifier (ID), and from that point onward they were referred to only by this ID in data files, analysis, and reporting to further safeguard confidentiality and reduce the risk of identifiability within a relatively small iwi provider context. In these ways, the consultation and recruitment processes sought to embody kaupapa Māori methodological values while navigating, and at times challenging, the constraints of a Western ethics system and a competitive, inequitable health environment.

Participants

Participants were kaimahi from Tūwharetoa Health Charitable Trust, a Māori health provider with offices in Taupō and Tūrangi. Staff were eligible if they worked in the Whānau, Pēpi, Tamariki (WPT) team within Outreach Immunisation Services (OIS), Well Child Tamariki Ora (WCTO), Kahu Taurima (KT), or in administration roles in the Operations (OPs) team, and those kaimahi who had user-permissions for the PMS Indici. In no particular order, teams were assigned a number and were referred to as Team 1, Team 2, Team 3, and Team 4, an additional step to reduce the risk of identifiability.

16 eligible kaimahi were identified, and eight consented to participate. Seven participants completed the full training (one clinical, six non-clinical). Participant 5 withdrew due to illness. Six kaimahi volunteered to participate and worked across the Taupō and Tūrangi localities. Participants' health-sector experience ranged from six months to over 50 years, and ages ranged from 26-73 years, with differing roles, responsibilities, and levels of Indici use and confidence across teams.

Ethical Approval And Consent

Ethical approval was sought from the University of Waikato Human Research Ethics Committee (HREC(Health)2025#31). See Appendix E for approval letter. Following this, the kaupapa lead met with the CEO and Operations Manager of Tūwharetoa Health to seek endorsement from the Board of Trustees (BOT) to engage with kaimahi. The CEO later confirmed that the BOT had granted permission for the research team to proceed with recruiting kaimahi from Tūwharetoa Health.

Koha

Koha is an expression of manaakitanga in Kaupapa Māori research, where participants' contributions are acknowledged through gifting rather than treated as a transactional payment. Tikanga such as koha protect relationships, uphold mana, and keep research interactions reciprocal and respectful, while signalling that the project is accountable to and embedded in the communities involved (Mead, 2016).

Kaimahi received small kai packs, see Appendix N, as koha and manaakitanga, as the Lead could not provide shared morning or afternoon tea after training. These koha packs were prepared before each session using supermarket items, supported by a small weekly koha budget. At the end of the study, each participant was gifted a small taonga, see Appendix O, to recognise their time and support – he iti te taonga, he pounamu.

Intervention Setting and Materials

Training Rooms

Training was facilitated across three of the Tūwharetoa Health office localities in available meeting rooms based in Taupō and Tūrangi. The first location was in the Tūwharetoa Health offices in Taupō based at Te Whāriki Aroha (TWA). All training was scheduled to be facilitated in the same rooms in both Taupō and Tūrangi for the duration of

the training. However, where room availability was impacted due to workplace clashes, an alternative consult room was utilised where a similar training set up could be provided. All room bookings were requested using an online room booking system or via email to an organisation administrator.

In Tūrangi, training took place in two locations. The first location was the Tūrangi Community Health Centre (TCHC) which is a shared clinical practice space that offers health services to the community. The second location in Tūrangi was in a community whare, Awhi House, which is owned by Tūwharetoa Health.

The research lead (referred to hereafter as the Lead) also sought verbal permission from the Operations Kaitataki to utilise the fleet vehicles for travel to the Tūrangi office for training sessions. Once permissions were granted the Lead utilised Fleetwise, an online booking system to confirm use of a vehicle for the corresponding days and times training occurred in the Tūrangi locations. All training across both localities took place during normal business hours.

Materials

Indici

Indici is a patient management system (PMS) commonly used across the health sector by General Practice (GP) and is the primary PMS used by Tūwharetoa Health and other health services based in Taupō and Tūrangi.

Indici is primarily used for recording whaiora consultation and clinical notes. Other information is also generated on patient enrolment if relevant e.g., when a pēpi is enrolled, recommended dates of immunisation activity are auto generated to align with the NIS. The activity dates populated can be found in each whaiora file and can provide details for

kaimahi for when to contact whānau for immunisation appointments or to confirm historical engagement.

Indici is accessed through a secure online portal. Kaimahi must have a username and password to access the portal and are required to log in through a secure network on an organisation device with secure user-permissions. Indici is also integrated with other online health technologies that can provide other relevant information regarding immunisation engagement such as the National Immunisation Register (renamed as the Aotearoa Immunisation Register). Kaimahi are provided training related to accessing this information within Indici and how to understand the information found in relevant areas to support engagement with whānau. The Lead researcher met all organisational requirements for gaining access to all functions of Indici.

Pre-training questionnaire

A pre-training questionnaire, see Appendix D, was developed to identify any participant self-reported knowledge gaps of Indici use. As the research lead was also an employee of the organisation, questionnaire development was informed by frequent users (coworkers) of Indici from both clinical and non-clinical roles who reviewed questions in the questionnaire. These coworkers provided supportive feedback for the questionnaire but were not consenting participants in the study. The questionnaire was amended based on their feedback, experience and knowledge to reflect additional areas of use to support Indici users. This feedback resulted in the inclusion of additional questions to probe and identify knowledge gaps for other uses within Indici to support the development of task analyses for training.

The final pre-training questionnaire collected demographic information (gender, age, education, work experience in the health industry) as well as previous use of health

technologies or PMS, preference for training styles, which parts of Indici were currently used, and what participants would like to know to help support their work. Responses were collected via a five-point Likert scale with responses ranging from (1 = strongly agree-5 = strongly disagree, 1 = very confident - 5 = not very confident). The pre-training questionnaire can be seen in Appendix D.

All participants agreed to include any responses to the pre-training questionnaire in the analysis. Identifiable information was removed to maintain anonymity of participants. Eight participants completed the pre-training questionnaire, but due to illness one participant was unable to begin the training programme. Only the information obtained from that participant's pre-training questionnaire was included in the analysis to support development of the task analysis. No further data was collected for this participant beyond the pre-training questionnaire.

Equipment

All training spaces provided access to a desk, power outlet, and chairs for The Lead and participant. Kaimahi completed their training on a Tūwharetoa Health issued Lenovo 14-inch laptop that had been set up to meet the security permissions required to access the Indici user platform on the secured internet network. An aluminium swivel laptop stand, a Microsoft wireless mouse, and a white Apple wired keyboard were also used. A tripod with phone attachment was also placed on the desk next to the laptop and an iPhone 12 Pro was used to record training sessions.

Task Analysis

An initial task analysis was developed from several sources: Indici online help portal, Indici user platform guided videos, the Tūwharetoa Health Guide to Hub Coordinating Manual and frequent Indici users who were not participating in the study but provided

feedback on TA development (i.e., coworkers). The responses collected from the pre-training questionnaire were also used to help inform the development of the first TA used in the baseline phase.

The first TA developed, see Appendix K, covered the key areas of workflow of a whaiora or pēpi details being loaded into Indici, covering varying core functions for file management e.g., updating whaiora details, through to sharing whaiora details back with general practice (GP). The first TA included 100 steps across all twelve areas of workflow. The first TA was used during baseline to determine where current knowledge and skills of using Indici were, as well as identify knowledge and skills gaps throughout the TA. During baseline, the initial TA was revised and modified with each participant to align with specific skills needed across the four teams: Team 1, Team 2, Team 3 and Team 4. This consultation process aligns with behaviour analysts' ethics codes core values and a KM approach.

Table 1 presents the TA (referred to as TA1) modified for Team 1, which includes nine areas of workflow with 60 observable steps. The steps were reduced to focus on core responsibilities and knowledge gaps identified by kaimahi in this participant group (e.g., updating contact logs and how to send an email from Indici).

Table 1

Task Analysis 1 (TA1) Developed for Team 1

Area of Workflow 1: Log in, Checking Tasks from Home Dashboard
1. Login to user profile - Username - User password 2. Open *Home* dashboard - Icon in top left of screen

3. Locate task label in left panel of home screen, select *Tasks*
   - Tasks table will populate in middle of screen
   - Active assigned tasks will be visible to user
   - If no active tasks visible proceed to step 10
4. Hover cursor over patient name of active task
   Selecting the task will direct user to the patient file
5. Read task instruction and complete required work
6. To close window, select *save* to proceed with work
   if task is now completed, select *complete* button in bottom left of task window. This will remove task from active task list.
   - If additional work is to be completed in task, update task details in note field
7. Set new *due date* in task
8. Select *save* to close task window

Area of Workflow 2: Patient Search and Information Check

10. Search patient in search field in top-centre-right of screen
    - Name search
11. Patient's file link will populate in the patient history list. Select patient's name
    - Upon selection, patient file will populate on-screen
    - User is now in the patient file
12. Locate patient details in green ribbon along the top of the patient file and check information is correct
    - Name
    - Date of Birth
    - Address
    - Gender
    - Ethnicity
    - Parent/Caregiver names included with contact numbers
      - Parent/Caregiver names will be visible when the cursor is hovered over the 'share' icon
      - If no share icon is visible, details have not been entered on patient enrolment
13. Select *family member's icon* to check patient next of kin (NOK) details are entered

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Area of Workflow 3: Checking for Enrolled Family Members

14. Select the *Family Members* icon along the top of the patient profile
15. Identify if known family members have been linked
    - Known enrolled family members are not listed
      - See step 16 for task instructions on how to create family member links

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Area of Workflow 4: Creating Family Member Links by Chart #

16. Select *Patient Edit* icon along the top of the patient file

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17. Locate chart number: *IND-TWH-XXXXXXXXX*
18. Copy whole chart number
19. Search for identified family member who is also enrolled as a patient with Tūwharetoa Health in patient search
    - Patient search is in top centre-right of dashboard
20. Select patient name listed in patient file log
    - Family members patient file will populate
21. Select *Patient Edit* within family member's profile
22. Locate chart number: *IND-TWH-XXXXXXXXX*
23. Select whole chart number including letters and numbers together
    - Delete
24. Select into field with cursor and 'paste' original family members chart number
25. Scroll to bottom of page and select *Finish and go to consult*
    - Page will close and return to the patient file dashboard, refreshing the page
26. Select family members icon – family link should now be visible
    - Repeat with all enrolled family members

Area of Workflow 5: NIR Status Query and Immunisation schedule

27. In patient timeline, identify if a recent National Immunisation Register (NIR) status query is visible
    - Search through consult notes in the *Timeline*, located in the right panel of the patient file. If there is a recent query in the patient consult you do not need to run a query. Proceed to step 32
    - If NIR Status Query has not been actioned, then go to next step
28. Select *Immunisation* label
    - Left panel of patient file. Scroll through labels to find Immunisations
29. NIR status query window will populate. Select *NIR Status Query* button, centre-right of immunisation dashboard
30. Change age range from 0–*current age* in drop down options and change search type to *wild card*
31. Select NIR Status Query button *(this takes approximately. 15–30 minutes to run the query)*
    - You will be returned to the immunisation schedule history log page

Area of Workflow 6: Immunisation Recall–Creating an Appointment

32. Select *recall* label
    - Recall label can be found in lower left panel of screen
33. Find next immunisations event in the recall dashboard
    - A new table will populate in the centre of the screen with active recall dates
34. Select relevant recall. A new window will populate on-screen with the recall details
35. Check provider details are correct
    - If Immunisation Kaitataki is listed as provider, go to step 37

- If provider details are incorrect, hover cursor over name in the *provider* field and highlight entire field
- Delete

36. Change provider to Immunisation Kaitataki
    - Write name of correct provider in field and press *enter*
    - *Search Provider* window will populate on-screen.
    - Select *provider name*
    - Screen will return to recall window
37. Change recall group if details have auto-populated to *vaccine schedule*
    - Hover cursor over down arrow and select correct recall group header
38. Hover cursor over down arrow in description box. Select the correct immunisation description to match vaccine group details: *6W, 3M, 12M, 15M, 4Y*
39. Select *save*
    - User will be returned to active recalls table

Area of Workflow 7: Assigning a New Task to a Team Member

40. Select *Tasks* label in patient file
    - Tasks table will populate in the centre of the screen
    - All active tasks will be visible to user
41. Select the *+* icon
    - Task window will populate in the centre of the screen
42. Write note regarding purpose of task into description box
43. Assign staff member to the task
    - Type staff members name or select name via the drop-down arrow to right of field Select the staff members name and press *enter*
44. Find *Due by* field and select due date
45. Select *Save* button at bottom of window to save task
    - Task window will close returning user to patient file

Area of Workflow 8: Creating Contact Logs

46. Select *Contacts* label
    - Contacts dashboard will populate
47. Hover cursor over *+* sign to add a new contact
48. Hover cursor onto down arrow in category field. Select relevant category. *Immunisations*
49. Hover cursor over down arrow and select *yes* or *no* to determine if contact was made.
50. Hover cursor over down arrow in outcome field
    Select relevant outcome i.e., booking made, other
51. Check date and time reflect when the contact was made. e.g., 12/11/2025, 10:30a.m.
52. Hover cursor into note field and leave a brief note
53. Select *save*. Contact log will now be saved

Area of Workflow 9: Closing Referral and Informing General Practice (GP)

54. Before closing referral back to GP, ensure consent has been obtained to share immunisation engagement back to enrolled GP.
    - Has consent been obtained via consent to share on enrolment form, carry on to step 55
    - If consent has not been obtained stop here
55. Select the *email icon* from the outbox label
56. Send email (private) dashboard will populate
    - Enter email address into *email* field
57. Select *Tūwharetoa Health OIS* in subject line
58. Select *OIS template* from drop down options
    - Update template where necessary
59. Review details in email. If satisfied with notes and consent to share is obtained. Select *Send email (private)*
60. Check status of email in outbox label
    - Record of email will be retained in outbox

Note. While there are 60 observable steps given in this TA, not all steps were completed by participants. If participants were familiar with an area of workflow and had developed new skills via generalisation, the observable step was marked an incorrect zero score (× mark) for not following the steps in sequence. A correct score was given of 1 (✓ mark) for subsequent steps if the participant then returned to the area of workflow to complete the remaining steps. NOK = Next of Kin, NIR = National Immunisation Register, NHI = National Heath Index, IND-THW-XXXXXXX= Indici-TūwharetoaHealth-Chart#, OIS – Outreach Immunisation Service

Table 2 shows the developed TA (referred to as TA2) for Team 2. The steps provided in this TA were modified to focus on core administration responsibilities, including responding to internal communications from other kaimahi. The TA covers seven areas of workflow with 40 observable steps. Although some participants do not make direct contact with whaiora enrolled with the service, some participants in some teams are familiar with where to find whaiora details for enrolment purposes. However, when asked to locate

specific whaiora details in baseline, they could not locate them (e.g., locate parent names for the details ribbon). This step was therefore included to help increase efficiency.

Table 2

Task Analysis 2 (TA2) Developed for Team 2

Area of Workflow 1: Log in, Checking Tasks from Home Dashboard.
1. Login to user profile - Username - User password 2. Open *Home* dashboard - Icon in top left of screen 3. Locate Tasks label in left panel of home screen, select *Tasks* - Tasks table will populate in middle of screen - Active assigned tasks will be visible to user - If no active tasks visible proceed to step 10 4. Hover cursor over patient name of active task - Selecting the task will direct user to the patient file 5. Read task instruction and complete required work 6. To close window, select *save* to proceed with work - if task is now completed, select *complete* button in bottom left of task window This will remove task from active task list 7. If additional work is to be completed in task, update task details in note field 8. Set new *due date* in task 9. Select *Save* to close task window
Area of Workflow 2: Patient Search and Information Check.
10. Search patient - Name search - NHI search 11. Patient file link will populate in the patient history list. Select *patient name* - Upon selection, patient file will populate on-screen - User is now in the patient file 12. Locate patient details in green ribbon of patient file and check information is correct: - Name - DOB - Address - Gender - Ethnicity

- Parent/Caregiver names included with contact numbers
    - Hover cursor over *share* icon to see Parent/Caregiver names are entered

13. Select *family members* icon to check patient next of kin (NOK) details are entered

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Area of Workflow 3: Checking for Enrolled Family Members

14. Select the *Family Members* icon along the top of the patient profile

15. Identify if known family members have been linked
    - Known enrolled family members are listed. No further work needed
    - Known enrolled family members are not listed,
        - Proceed to step 16 for task instructions on how to create family member links

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Area of Workflow 4: Creating Family Member Links by Chart Number

16. Select *Patient Edit* icon along the top of the patient file

17. Locate chart number: *IND-TWH-XXXXXXXXX*

18. *Copy* whole chart number

19. Search for identified family member who is also enrolled as a patient with Tūwharetoa Health in patient search
    - Patient search is in top centre-right of dashboard
20. Select *patient name* listed in patient file log
    - Family members patient file will populate
21. Select *Patient Edit* within family member's profile

22. Locate chart number: *IND-TWH-XXXXXXXXX*

23. Select whole chart number including letters and numbers together
    - Delete
24. Select into field with cursor and *paste* original family members chart number

25. Scroll to bottom of page and select *Finish and go to consult*
    - Page will close and return to the patient file, refreshing page,
26. Select family members icon – family link should now be visible.
    - Repeat with all enrolled family members

Area of Workflow 5: NIR Status Query and Immunisation Schedule

27. Identify National Immunisation Register (NIR) query in patient consult notes to see recent immunisation update
    - Search through consult notes in the *Timeline*, located in the right panel of the patient file
    - If there is a recent query in the patient consult you do not need to run a query. Stop here.
    - If NIR Status Query has not been actioned, then go to next step.
28. Select *Immunisation* label.
    - Left panel of patient file. Scroll through labels to find *Immunisations*

29. Select *NIR Status Query* button, centre-right of immunisation dashboard
    - NIR status query window will populate
30. Change age range from 0 – *current age* in drop down options and change search type to *wild card*
31. Select NIR Status Query button *(this takes approximately 15–30 minutes to run the query)*
    - You will be returned to the immunisation schedule history log page

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Area of Workflow 6: Assigning a New Task to a Team Member

32. Select *Tasks* label in patient fil
    - Tasks table will populate in the centre of the screen
    - All active tasks will be visible to user
33. Select the *+* icon
    - Task window will populate in the centre of the screen
34. Write note regarding purpose of task into description box
35. Assign staff member to the task
    - You can start typing staff members name or select name via the drop-down arrow to right of field
36. Find due by field and select *due date*
37. Select *Save* button at bottom of window to save task
    - Task window will close returning user to patient file

Area of Workflow 7: Adding Service Alerts

38. Hover cursor over alert *+* in top left corner of patient dashboard
39. Select *alert* label from drop down options
    - Add any additional details if necessary
40. Select *Save* to close alert window

Note. While 40 observable steps are given in this TA, not all steps were completed by participants. If participants were familiar with an area of workflow and had developed new skills via generalisation, the observable step was marked an incorrect zero score (× mark) for not following the steps in sequence. A correct score was given of 1 (✓ mark) for subsequent steps if the participant then returned to the area of workflow to complete the remaining steps. NOK = Next of Kin, NIR = National Immunisation Register, NHI = National Heath Index, IND-THW-XXXXXXX= Indici-TūwharetoaHealth-Chart#.

Table 3 illustrates the TA (referred to as TA3) developed for participants from Team 3. These participants were not required to perform a large portion of administrative functions. Therefore, TA3 was modified to focus on core responsibilities (e.g., identifying linked family members and finding immunisation dates for appointment scheduling). The number of observable steps was reduced to 18 across five areas of workflow. One area of workflow, 'How to make notes confidential', was added by request of a participant, as it was a self-reported skill deficit identified through the pre-training questionnaire.

Table 3

Task Analysis 3 (TA3) Developed for Team 3.

Area of Workflow 1: Log in, Search Patient, Confirm Details
1. Login to user profile - Username - Password 2. Search patient - Name search - NHI search 3. Locate patient details in green ribbon of patient file and check these are correct: - Name - DOB - Address - Gender - Hover cursor over *share* icon to see Parent/Caregiver details 4. Select *family members* icon to check patient next of kin (NOK) details are entered
Area of Workflow 2: Checking for Family Member Links
5. Select the *Family Member* icon 6. Identify known family members in the family member links - If known enrolled family members are not listed set a task to Hub Coordinators to add.
Area of Workflow 3: Checking Immunisation History
7. Find *immunisation* history log 8. Identify next immunisations due in the schedule

9. Identify date for the next immunisation due
    - This will determine when to have a conversation with whānau about upcoming immunisations

Area of Workflow 4: Opening and Assigning a Task to a Team Member
10. Select *Tasks* label along the left side of screen - Tasks table will populate in centre of screen - Active tasks will be visible to user
11. Hover cursor over username to open active tasks or select the *+* icon to create a new task
12. Write note regarding purpose of task into description box
13. Assign staff member to the task - You can start typing staff members name or select name via the *drop-down arrow* to right of field
14. Select the *due by* date to be set at a date before the immunisations due date that you retrieved earlier from the immunisations history log
15. To close window, select *save* or *complete* if task is now closed
Area of Workflow 5: Making Notes Confidential
16. Find *Notes* label in left panel
17. Write notes into consult note file dashboard in centre of screen Notes automatically save after 10–20 seconds
18. Select *confidential* box found (along the top of the notes writing box) - Notes will only be visible to writer if confidential has been selected

Note. While 18 observable steps are given in this TA, not all steps were completed by participants. If participants were familiar with an area of workflow and had developed new skills via generalisation, the observable step was marked an incorrect zero score (× mark) for not following the steps in sequence. A correct score was given of 1 (✓ mark) for subsequent steps if the participant then returned to the area of workflow to complete the remaining steps. NOK = Next of Kin, NIR = National Immunisation Register, NHI = National Heath Index.

Table 4 shows the TA (referred to as TA4) for Team 4. TA4 was modified to focus on a combination of administrative functions (e.g., linking family members) and locating immunisation details to support appointment scheduling (e.g., identifying due dates from the immunisations dashboard). Thirty-eight observable steps across six areas of workflow

were identified for this TA. The kaimahi in this role were non-clinical and worked directly with whānau to help access health services for pēpi and māmā. Some of their responsibilities are administrative for other teams but only to support scheduling appointments if requested.

Table 4

Task Analysis 4 (TA4) Developed for Team 4

Area of Workflow 1: Log in and Patient Search
1. Login to user profile - Username - User password 2. Open *Home* dashboard - Icon in top left of screen 3. Locate task label in left panel of home screen, select *Tasks* label - Tasks table will populate in middle of screen. Active tasks will be visible to user 4. Hover cursor over active task. Selected task will populate on-screen within patient file - If no active tasks visible proceed to step 5 5. Search patient - Name search - NHI search 6. Patient file link will populate in the patient list. Select *patient name* - Upon selection, patient file will populate on-screen. You are now in the respective patient file
Area of Workflow 2: Checking and Writing Tasks within Patient File
7. In patient file, locate *Tasks* label in left panel of screen - Scroll down options to find task label - Patient task dashboard will populate on the screen 8. Hover cursor over assigned user task 9. Read task instruction and complete required work 10. To close window, select *save* to proceed with work or *complete* if the work is now completed, removing task from active task list. 11. If additional work is to be completed in task, update task details in note field 12. Set new *due date* in task 13. Select *Save* to close task window

Area of Workflow 3: Assigning a New Task to a Team Member

14. Select *Task* label in patient file
    - Tasks table will populate in the middle of the screen
15. Select the *+* icon
16. Write note regarding purpose of task
17. Assign staff member to the task
    - You can start typing staff members name or select name via the drop-down arrow to right of field
18. Select the *due by* date to be set at a date before the immunisations recall due date
19. *Save* task

Area of Workflow 4: Checking for Enrolled Family Members

20. Select the *Family Members* icon along the top of the patient profile
21. Identify if known family members have been linked
    - Family members are listed. No further work needed.
    - Enrolled Family members are not listed,
        - Proceed to step 22 for task instructions on how to create family member links, or
        - Return to step 14 on assigning a task to a team member

Area of Workflow 5: Creating Family Member Links by Chart Number

22. Select *Patient Edit* icon along the top of the patient file
23. Locate chart number: *IND-TWH-XXXXXXXXX*
24. Copy whole chart number
25. Search for identified family member who is also enrolled as a patient with Tūwharetoa Health in *patient search*
    - Patient search is in top centre-right of dashboard
26. Select *patient name* listed in patient file log
    - Family members patient file will populate
27. Select *Patient Edit* within family members profile
28. Locate chart number: *IND-TWH-XXXXXXXXX*
29. Select whole chart number including letters and numbers together
    - *Delete*
30. Select into field with cursor and paste original family members chart number
31. Scroll to bottom of page and select *Finish and go to consult*
    - Page will close and return to the patient file, refreshing page
32. Select *family members* icon, family link should now be visible
    - Repeat with all enrolled family members that need to be linked

Area of Workflow 6: NIR Status Query and Immunisation schedule

33. Identify National Immunisation Register (NIR) status query in patient consult notes to see recent immunisation update.
    - If there is a recent query in the patient consult go to step 38
    - If NIR Status Query has not been actioned, then go to next step
34. Select *Immunisation* Label
    - Left panel of patient file. Scroll through labels to find Immunisations
35. Select *NIR Status Query* button, centre-right of immunisation dashboard
    - NIR status query window will populate
36. Change age range from 0–*current age* in drop down options and change search type to *wild card*
37. Select *NIR Status Query button (this takes approximately 15 – 30 minutes to run the query)*
    - You will be returned to the immunisation schedule history log page
38. Locate date of immunisation event *6W, 3M, 5M, 12M, 15M, 4Y*
    - Record date for respective immunisation event. This date will support with when to have immunisation conversations with whānau

Note: While 38 observable steps are given in this TA, not all steps were completed by participants. If participants were familiar with an area of workflow and had developed new skills via generalisation, the observable step was marked an incorrect zero score (× mark) for not following the steps in sequence. A correct score was given of 1 (✓ mark) for subsequent steps if the participant then returned to the area of workflow to complete the remaining steps. NIR = National Immunisation Register, NHI = National Heath Index, IND-THW-XXXXXXX= Indici-TūwharetoaHealth-Chart#.

Post-Training Confidence Levels

Post-training confidence levels were collected from each participant in a post-training questionnaire, see Appendix F. Each participant was asked to rate the BST training, participant confidence, familiarity, ease of following BST, confidence to train peers, and level of learning related to the functions of Indici. All responses were collected on a five-point Likert scale (1 = strongly agree–5 = strongly disagree) see Appendix L. Participants reported feeling more confident using Indici in their daily work and would recommend BST

as a form of training. Over half reported confidence to train others, and 85.7% found BST easy to follow.

General Procedure

To ensure each session was delivered consistently the Lead created a tikanga and kawa guide, see Appendix P, to refer to for clarification if any item or procedural step was missed. Prior to training, the Lead sent a text message reminder to participants of their session to confirm attendance. Phone numbers used were those given by participants in the consent form provided, see Appendix B. A prompt in the text message also reminded participants to know their Indici username and password.

A kai pack was prepared each morning to present to each participant on arrival. The Lead then set up the training room and logged into the laptop to ensure it was operational and connected to the internet. The Lead also had copies of each TA so that these were available throughout training. She then logged onto Indici using their assigned organisation username and password.

Once in Indici, the fake patient training accounts ‘Mickey Mouse’ and ‘Minnie Mouse’ were accessed The Lead created Indici assigned tasks within the application which corresponded with specific areas of workflow in each TA. The Lead assigned these tasks before each training session to observe if participant responses came under stimulus control (Skinner, 1965). Tasks assigned functioned as written discriminative stimuli (S^Ds, the task in Indici) and set the occasion for the participant to respond. Following a response, appropriate feedback was given (positive reinforcement i.e., verbal praise) given immediately. Tasks assigned within Indici consisted of: “Please check Mickey has any linked family member’s”, “Minnie is Mickey’s sister can you please link as a family member”, “Can you check the patient timeline for a recent NIR query”, “ Please action a NIR query for

Mickey", "Please tell me the date for Mickey's 15M immunisation and when is the next immunisation event in the schedule", and "who is the immunisation provider for the next immunisation appointment". Additional verbal S^Ds were given to participants where a verbal response was required e.g., "Can you please tell me Mickey's date of birth, ethnicity, address…", "can you tell me tell the name of Mickey's next of kin?".

On participant arrival for training, whakawhanaungatanga and karakia were prioritised. The Lead also obtained verbal consent to record the training session. Participants were advised training would be undertaken in a fake account with fake details. Any details and activities conducted in these accounts did not cause any disruption to Indici.

Participants were asked to take their seat at the laptop and to login to Indici with their username and password. If participants were unsure of their password, the Lead provided support to retrieve usernames and passwords through the software administrator. This support was required for one participant on two training sessions. Participant usernames and passwords remained confidential from the Lead and were not recorded.

Baseline Session

During the baseline session, the Lead gave verbal prompts related to each TA. Some steps in the TA required a verbal instruction, functioning as a verbal discriminative stimulus (S^D), "Can you please tell me Mickey's ethnicity?" which required a specific verbal response. Immediately after the participant's verbal response was heard verbal reinforcement was given e.g., "Yes that's right" or "Thank you" and a correct score of 1 (✓ mark) was recorded on the TA. If the Lead observed the participant respond incorrectly to the verbal S^D but no verbal response was given, training was briefly paused. During this pause, some participants continued to interact with the Indici interface before verbally responding "I am a tutu and will try and figure it out", "I don't know", or "I can't find the

details". A verbal response from a participant signalled it was time to move on. When an incorrect or incomplete response was observed, verbal feedback was given immediately "we will move on to the next step now". This decreased incorrect responses for task completion and prevented further responses from being incorrectly reinforced, a form of errorless learning (Cooper et al., 2020). The Lead would score the step a zero (X mark) on the TA.

As the consultation process was ongoing during the baseline session, participants were able to provide feedback on relevant areas of the TA. This provided opportunity to co-design and adapt the TA with each participant according to their role (Cooper et al., 2020). There was one baseline session across all participants. Training then progressed according to the modified TA (see Tables 1 to 4).

Behavioural skills training

BST involves four phases: Instruction, modelling, rehearsal, and feedback (Erhard et al., 2019). During the instruction phase of training the Lead read through the TA with the participant. Participants were encouraged to ask questions or explain any steps in the TA that were not relevant to their role so the TA could be modified according to the core responsibilities of each team. In the modelling phase the Lead logged into their own User account for Indici and performed each of the tasks with the participant. Participants were encouraged to ask questions at any time if they wanted further explanation about the functionality and purpose of the area in Indici and its role in supporting their work within the immunisation referral process. In the rehearsal phase participants were given an opportunity to perform each of the tasks given in the TA. The Lead gave feedback simultaneously to the participants during the rehearsal phase relative to the step they were following. Feedback included phrases such as "yes that's correct", and "where else might

you look?" If the participant was unable to follow the instruction, verbal feedback included "let's move onto the next step".

Where participants required any prompting to complete steps the Lead followed a least-to-most response prompt schedule (Cooper et al., 2020). The Lead observed each participant completing steps in the TA as they were being completed. If participants verbally responded "I don't know" the Lead waited and provided a verbal prompt (least prompt - verbal S^D). If participants were observed responding incorrectly again and gave a verbal response "I don't know what I'm doing" the Lead delivered a verbal S^D with a gestural prompt (e.g., "This is where you find …" while pointing to information on the screen). If participants were unable to complete the step with a verbal prompt and gesture, the Lead would prompt with modelling (most prompt e.g., "This is how you can find the…" while demonstrating the steps to find the information on-screen). If prompts were required during rehearsal, the Lead would score a 0 (x mark) for the corresponding step.

Mastery

Mastery was achieved when participants were able to complete the task analysis with 80% or more correct steps for two consecutive trials (e.g., Sump et al., 2019). Some participants achieved 80% task accuracy in a second or third training session, however some participant scores were impacted by uncontrolled generalisation effects during training sessions. Additional training sessions were given to observe if participants were able to achieve task completion consistently.

Follow-up: Maintenance probe

A single follow-up probe was facilitated for all participants a minimum of two weeks from the last training session to assess for skill maintenance. Participants did not have access to Indici during this time due to a Tūwharetoa Health closure over this period.

Participants were asked to complete the session at their desk or an alternative location that differed from where training occurred. The Lead accessed Indici prior to the session and assigned tasks through Indici. Each participant follow-up session was recorded and scored with the appropriate TA. Participants did not have access to the TA. All recording occurred as per the training sessions. Maintenance was demonstrated if participants scored 80% task accuracy.

Data Analysis

All data were entered into Microsoft Excel following each training session. Once all training data had been collected Excel was then utilised to create graphs to present the information visually. The percentage of correctly performed TA steps was calculated by dividing the number of correct steps by the total of number possible steps and multiplying by 100.

All methods for the study were given ethical approval from the University of Waikato Human Research Ethics Committee (HREC(Health)2025#31).

Intra-Observer Agreement

Each training session was recorded for the purposes of recruiting a second observer to calculate inter-observer agreement (IOA) (Cooper et al., 2019). However, as the training sessions progressed, finding a second observer with prior experience and user knowledge of Indici was problematic. A second observer would need to be familiar with the Indici interface and the multiple ways a participant could access information. In an attempt to adhere to procedural integrity, the Lead researcher calculated intra-observer agreement.

As recommended by Cooper et al. (2019) a subset of recordings were selected from all participants. All baseline sessions, 30% of BST-intervention, and all follow-up sessions selected for each participant. All sessions were viewed and scored blind.

Results

The experimental design followed a non-concurrent multiple baseline design across participants. Participant accuracy was scored against a TA assigned according to employment team (e.g., TA1–Team 1, TA2–Team 2, TA3–Team 3, and TA4–Team 4). Percentage of task accuracy was calculated by total correct steps divided by total steps multiplied by 100.

Interobserver agreement (IOA) (see Table 5) provides scores for all participants. The Lead blind scored all participant TAs a minimum of two weeks following termination of the BST Intervention phase.

IOA was scored for total number of agreements for correct completion of a task by the total number of agreements added to the total number of disagreements multiplied by 100. Mean IOA across participants was 90.56% (range = 81.69%–95.59%), indicating a high IOA.

Table 5

Summary of Intraobserver Agreement Calculated for Each Participant Across Phases

Participant ID	Baseline %	BST Phase %	Maintenance %	Overall IOA %
1	100.00	74.07	94.44	81.69
2	92.11	81.58	97.37	87.67
3	94.74	78.42	100.00	93.42
4	97.73	93.18	88.64	93.18
6	100.00	92.65	97.06	95.59
7	89.23	90.77	89.23	90.00
8	97.83	86.96	97.06	92.39

Note. Where a procedural error occurred in the BST Intervention phase, these scores have been omitted.

Figure 1 shows the percentage of correct steps achieved for Participants 1 using TA3 – Team 3. Participant 1 demonstrated four correct steps in TA3 in baseline, achieving 22.22%. Participant 1 then went on to complete 10 training sessions. Note that scores were omitted in session 3 due to a procedural error (task analysis was not available to the participant during training). Participant 1 completed a single follow-up session 18 days following termination of the training phase and demonstrated 17 (94.44%) correct steps indicating maintenance was achieved. Participant 1 took 9.49 minutes on average to complete all steps in TA3 across sessions. Accuracy improved from 22.22% at baseline to 94.44% in the maintenance phase.

Figure 1

Percentage of Correct Steps Completed in Task Analysis 3 Across Baseline, Behaviour Skills Training, and Maintenance Phases for Participant 1

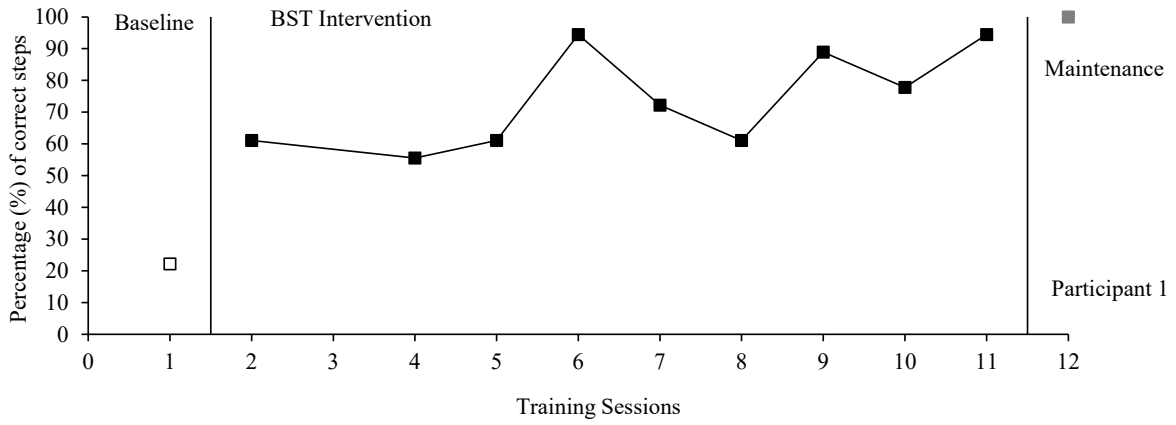
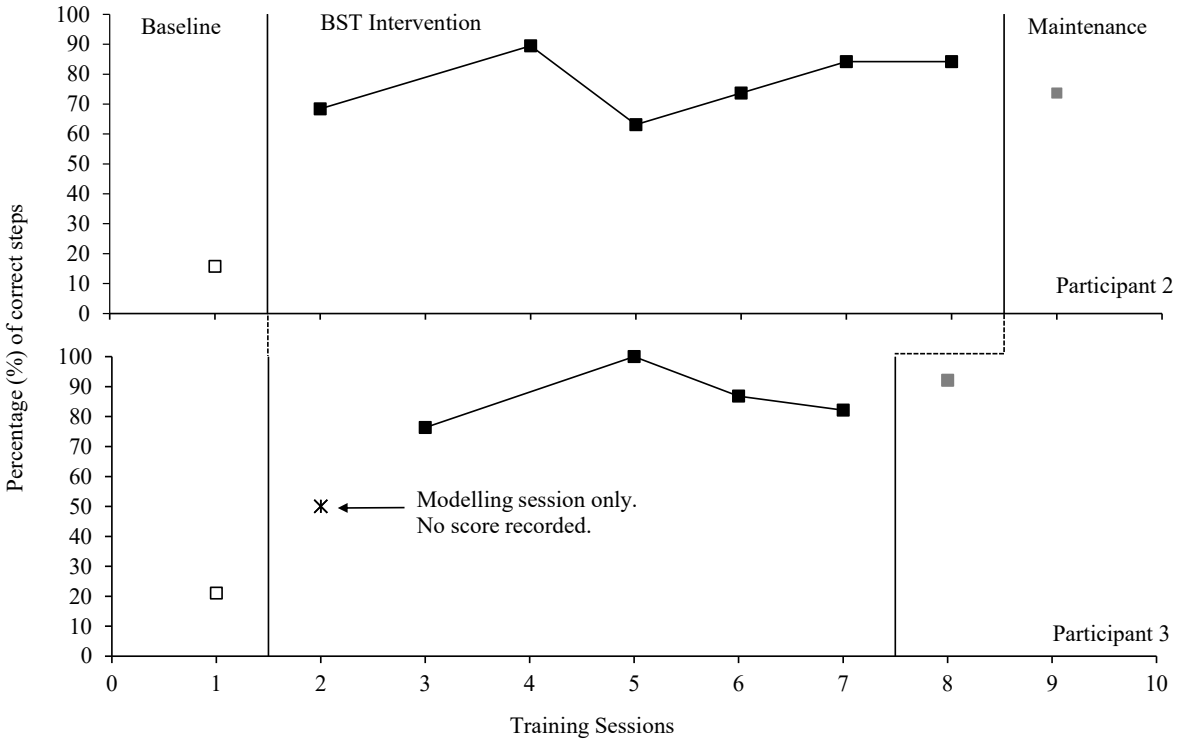


Figure 2 depicts the percentage of correct steps achieved by Participant 2 (top panel) and Participant 3 (bottom panel) who completed TA4 – Team 4. BST was effective at improving task accuracy for both participants; however maintenance of skills differed between them. Participant 2 demonstrated four correct steps in baseline achieving 15.79%

and went on to complete seven training sessions. Note that scores were omitted in session 3 due to a procedural error. Participant 2 completed a single follow-up session 39 days following termination of the training phase and demonstrated 28 (73.68%) correct steps. This indicates maintenance was not achieved (≦80%) and further training may be required to maintain skill mastery.

Figure 2

Percentage of Correct Steps Completed in Task Analysis 4 Across Baseline, Behaviour Skills Training, Post-Training and Maintenance Phases for Participants 2 and 3.



Note. ∗ indicates a modelling session with a zero score. Participant was unable to complete all BST phases of the TA due to scheduling constraints and prioritising work commitments. In lieu of time the Lead modelled the steps in the TA only.

Participant 2 took 8.91 minutes on average to complete all steps in TA4 across sessions. Accuracy improved from 15.79% at baseline to 73.68% at follow-up. Participant 3 demonstrated eight correct steps in baseline achieving 21.05% and completed six training sessions. No scores were recorded for session 2 due to a conflict with the participant's schedule and prioritising work commitments. A modelling session was offered in lieu of time. Note that scores were omitted in session 4 due to a procedural error. Participant 3 completed a single follow-up session 47 days following termination of the training phase and demonstrated 35 (92.11%) correct steps indicating maintenance was achieved. Participant 3 took 4.68 minutes on average to complete all steps in TA4 across sessions. Accuracy improved from 21.05% at baseline to 92.11% in follow-up.

Figure 3 depicts the percentage of correct steps achieved by Participant 4 (top panel) and Participant 6 (bottom panel) who completed TA2 – Team 2. Participant 4 demonstrated ten correct steps in baseline achieving 22.73% and completed four training sessions. Note that scores were omitted in session 3 due to a procedural error. Participant 4 completed a single follow-up session 28 days following termination of the training phase and demonstrated 43 (97.73%) correct steps indicating maintenance was achieved. Participant 4 took 11.17 minutes on average to complete all steps in TA2 across sessions. Accuracy improved from 22.73% at baseline to 97.73% in follow-up. Participant 6 demonstrated four correct steps in baseline achieving 11.76% and completed five training sessions. Note that scores were omitted in session 3 due to a procedural error. Participant 6 completed a single follow-up session 35 days following termination of the training phase and demonstrated 28 (82.35%) correct steps indicating maintenance was achieved. Participant 6 took 8.83 minutes on average to complete all steps in TA2 across sessions. Accuracy improved from 11.76% at baseline to 82.35%.

Figure 3

Percentage of Correct Steps Completed in Task Analysis 2 Across Baseline, Behaviour Skills Training, Post-Training and Maintenance Phases for Participants 4 and 6.

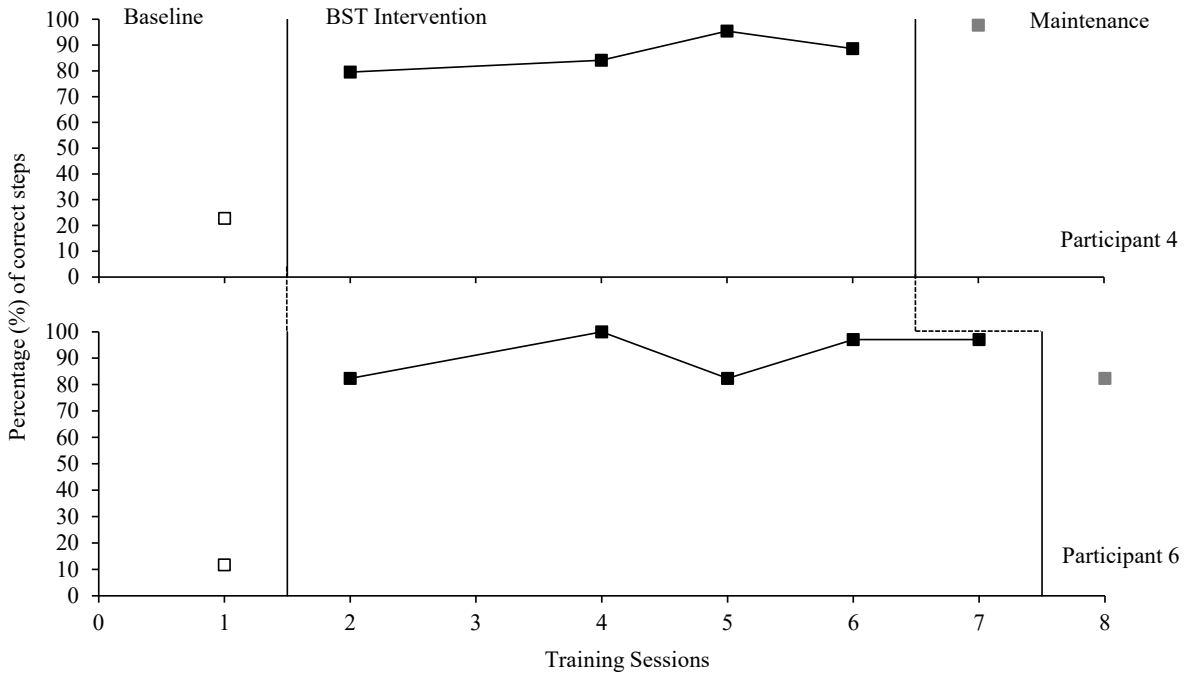
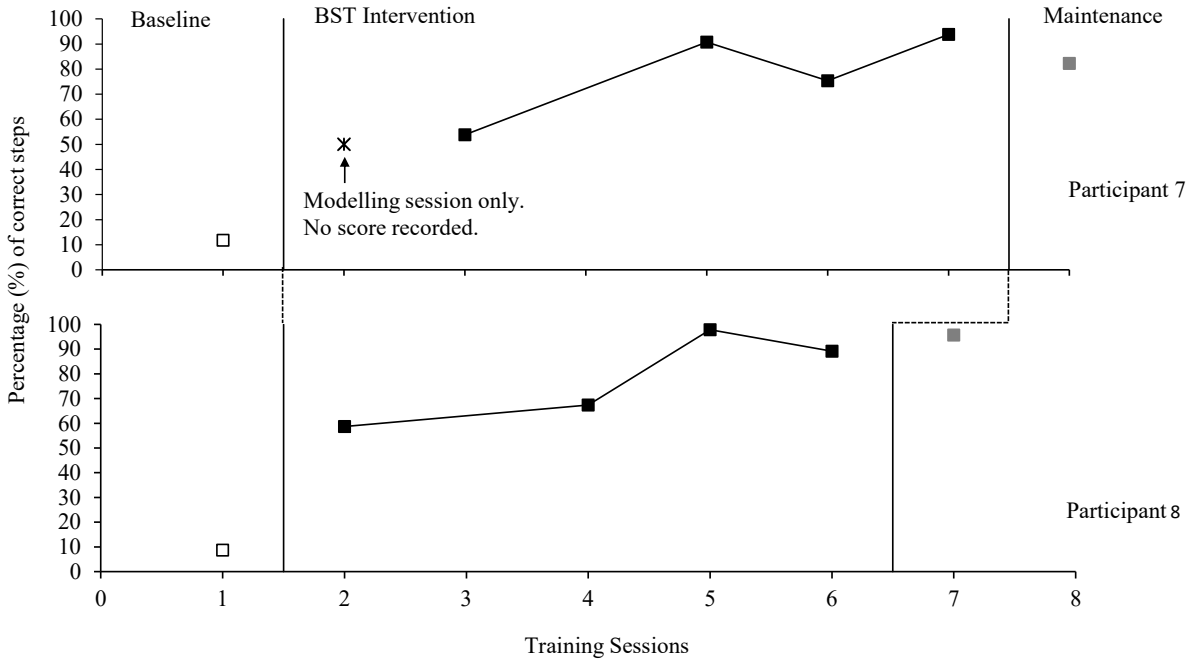


Figure 4 depicts the percentage of correct steps achieved across Participant 7 (top panel) and Participant 8 (bottom panel) using TA1 – Team 1. Participant 7 demonstrated 19 correct steps in baseline achieving 29.23% and completed four training sessions. No scores were recorded for session 2 as the training session did not proceed at request of the participant. A modelling session was offered in place of full training. Note that scores were omitted in session 4 due to a procedural error. Participant 7 completed a single follow-up session 28 days following termination of the training phase and demonstrated 60 (92.31%) correct steps indicating maintenance was achieved. Participant 7 took 13.61 minutes on

average to complete all steps in TA1 across sessions. Accuracy improved from 29.23% at baseline to 92.31%. Participant 8 then demonstrated four correct steps in baseline achieving 8.70% and went on to complete four training sessions. Note that scores were omitted in session 4 due to a procedural error. Participant 8 completed a single follow-up session 42 days following termination of the training phase and demonstrated 44 (95.65%) correct steps indicating maintenance was achieved. Participant 8 took 5.97 minutes on average to complete all steps in TA1 across sessions. Accuracy improved from 8.70% at baseline to 95.65% in follow-up.

Figure 4

Percentage of Correct Steps Completed in Task Analysis 1 Across Baseline, Behaviour Skills Training, Post-Training and Maintenance Phases for Participants 7 and 8.



Note: ✳ indicates a modelling session with a zero score. Participant requested a modelling session only.

Participants 1, 3, 4, and 8 demonstrated 80% or higher in the follow-up session indicating BST was effective in skill maintenance. Participant 2 scored 73.68% in the follow-up session indicating further training may be required to support skill maintenance. Participants 6 and 7 achieved more than 80%, which shows a decline in accuracy since termination of BST. Additional booster sessions may be effective in achieving skills maintenance.

Discussion

Purpose

This study examined how behavioural skills training (BST), embedded within a kaupapa Māori co-design approach, could improve kaimahi skills when using a patient management system (PMS), Indici. All participants demonstrated improvement in task accuracy using Indici following the introduction of BST and maintained that accuracy post-training. Although confidence is not a formal behavioural measure in applied behaviour analysis, kaimahi aspirations for whakawhanaungatanga-based peer training meant it was important first to build accurate, fluent Indici skills and then explore whether kaimahi felt more confident to tautoko their colleagues when providing peer training (Parsons, 2013; Rewi, 2010). In this way, the project positioned BST not only as a technical training tool but demonstrates a behaviour-analytic technique being integrated as one component of a wider kaupapa Māori strategy to enhance mana motuhake, whanaungatanga, and manaaki within an iwi-owned hauora service (Smith, 2012; Rolleston et al., 2022).

A kaupapa Māori co-design approach helped guide the consultation process with the organisation and participants to ensure the project was guided by organisational values and aspirations. This provided a framework for kaimahi to share, collaborate, and contribute to BST, which was effective at increasing task accuracy for most participants. Where a decline

in mastery was observed, it highlighted the design methodologies and considerations within an applied setting. Influences caused by organisational closures and service cycles limited opportunities for some kaimahi to practice and consolidate new Indici skills between training and follow-up, an issue consistent with wider system-level constraints in Indigenous health services (Pipi et al., 2002; Rolleston et al., 2022). While this is not solely a methodological issue, it raises for discussion training designs that anticipate such cycles, building in booster sessions or refresher opportunities when staff return from extended breaks, or when systems are updated (Cooper et al., 2020).

Findings

BST is an effective evidence-based approach which uses a four-phase method of training: instruction, modelling, rehearsal, and feedback (Dib & Sturmey, 2012). It draws on the behaviour-analytic principles by specifying observable steps demonstrated through following a TA, which breaks a task down into smaller components to teach the acquisition of new skills. BST has evidenced success in many applied settings, such as teaching safe header skills to youth soccer players (Quintero et al., 2020), improving the interviewing skills of university students (e.g., Stocco et al., 2017) and teaching medical students to teach safe infant sleeping environments (e.g., Mery et al., 2022). BST was effectively woven together with a kaupapa Māori design and applied in a hauora Māori setting. TAs were co-developed with kaimahi so that training reflected real workflows and whānau-facing responsibilities rather than generic software tasks. This collaborative process reflects KM commitments to communities shaping the research and acknowledges kaimahi as experts in their own mahi (Goodwin & Boulton, 2024; Kidd et al., 2021).

Implementation of BST has also been successful in the training of basic computer skills to support individuals with neurodivergent diagnoses and developmental disabilities

(DD) (Dotson et al., 2013; Sump et al., 2019). The current findings support this research and show that BST can be a useful training tool to teach computer related skills with participants outside of these populations, who did not have any disclosed neurodivergent diagnoses or DD. Another notable difference between the current research and prior studies is the complexity of TA development. Dotson et al. (2013) used TA with a 4-step process for 15 sub-component behaviours, and Sump et al. (2019) used a TA and 11-step process for three computer applications. The TAs developed for the current study involved steps that ranged from 18-65 steps across 5-9 sub-component groups, which highlights the complexity of Indici as a computer application. As the purpose of a TA is to reduce a task to simple, more manageable steps, the large TAs used in the current study may have been suboptimal.

While Indici itself functioned as both the focus and the backdrop of this work, its complexity shaped how BST could be applied and interpreted. As a richly featured, highly configurable practice management system, Indici offers multiple pathways to complete the same task and presents dense screens of information. Like other clinical platforms, it can be experienced by users as unintuitive with occasional navigational and interface issues (Cavanagh et al., 2022; Gosak et al., 2022). Barnard-Brak et al. (2023) identified in their research with TA development for individuals with DD that more than seven steps in a TA was complex and required more demand from the TA user. While their research involved individuals with DD, the findings provide guidance for consideration with other populations. While BST has been shown effective for training basic computer skills (e.g., Dotson et al., 2013; Sump et al., 2019) it may be more useful for a system like Indici to start novel users with the basic functions and a simplified TA that can be learned to facilitate more experienced use.

Despite the complexity and variability of the TAs used, all participants demonstrated increased task accuracy in the BST-intervention phase. All participants had received peer-to-peer training for Indici prior to this study, and all identified some knowledge and exposure with the PMS functions. BST was layered over existing habits rather than introduced into a neutral environment, with prior learning and experience resulting in conditional discrimination to stimuli that had not been introduced during training (e.g., 'x' to close a window, instead of selecting 'complete'). In effect, generalisation was occurring. Generalisation is a dimension of behaviour analysis that is a desirable outcome of training that behaviour analysts must plan for in their intervention. Generalisation is said to occur when new skills learned or trained are maintained across time and different settings (Baer et al., 1968). In the current study, where response generalisation was occurring, it was difficult to evaluate if these were effects of the training or the effects of prior learning histories and the continued interaction with Indici outside of training sessions. Where response generalisation did occur, users frequently bypassed task accuracy for task efficiency, resulting in responses that were reinforced by quicker whole task completion. Similarly, instances where changes in the Indici interface disrupted previously accurate performance underscore the importance of programming for generalisation across software updates and variable digital environments rather than assuming mastery with one interface will automatically transfer to another (Dotson et al., 2013; Gosak et al., 2022).

An additional consideration is the nature of the applied setting where BST was based. It was unrealistic to request kaimahi to limit or stop using Indici for the duration of the training programme. Four participants were high users of Indici as part of their core roles and responsibilities, while three participants only used Indici for light clerical duties. Controlling for use of Indici outside of BST training was not possible, as Cooper et al. (2020) explains

that denying treatment (in this case training) to strengthen experimental analysis is not always possible. Therefore, controlling for the effects of Indici use outside of BST sessions was not measured and Indici use outside of training may have influenced task accuracy over time. This lack of a simple, standardised control pathway between participants and the programme complicated the application of BST, but it also reflected the real conditions under which iwi providers must work.

While BA has its foundations in a Western philosophical paradigm, this study was guided by and with a KM values based approached. Through a co-designed methodology, the organisational and workforce realities of an iwi provider, operating within a complex colonial health system, the two psychologies provided an intersection of methodologies where an effective outcome was achieved (Goodwin & Boulton, 2024). Through the two paradigms intersecting, tensions were identified from designing and delivering the intervention within the study timeframe, while working with the aspirations of a hauora Māori to meet the needs of their community. BA methodology invites tighter experimental controls and more repeated measurement, while a kaupapa Māori approach required that the research remains accountable to whānau, iwi governance, and kaimahi wellbeing, even if that data was messier (Kidd et al., 2021; Smith, 2012). Despite these tensions, with the guidance of KM methods, BST proved to be effective and may offer valuable learning opportunities in the future by creating accessible training pathways for Indici use.

As suggested, BST is an effective tool to train task accuracy, however a secondary outcome in this study was the reported increase in kaimahi confidence to tautoko peer training. Peer training is commonly used in applied settings (Erath et al., 2021; Parsons et al., 2013), and while this study did not measure accuracy of the trainee becoming a trainer (e.g., Olaff, 2025), perceptions of participant confidence levels were collected, which indicated to

have increased overall. The increase in self-reported confidence to train peers is interpreted cautiously, as it was derived from subjective insight rather than objective evidence of training performance. However, it is still meaningful in a kaupapa Māori context where relational readiness and perceived capability matter for whether people feel able to step into tuakana-teina or mentoring roles (Kidd et al., 2021; Rolleston et al., 2022). A logical next step would be to evaluate a fully developed kaupapa Māori pyramidal BST model, in which kaimahi who have completed training go on to deliver BST to colleagues, with both trainer and trainee behaviour measured over time (Cooper et al., 2020; Parson, 2013).

Kaupapa Māori Co-Design Approach

Finally, the discussion highlights that whakawhanaungatanga is not an optional add-on to BST in this context; it is central to how the intervention worked. Western training models often focus on individual performance change in isolation from relationships, but here the strength of the findings sits in the combination of accurate task performance and strengthened relational capability for peer-to-peer support. By building BST within processes that valued kanohi kitea, reciprocity, and collective sense-making, the study suggests that kaimahi can gain skills that travel across systems and updates; the real training outcome is not only knowing the *right* Indici clicks, but having the confidence, relationships, and shared language to work through any system together in the service of whānau (Rewi, 2014; Smith, 2012).

Taken together, the current findings suggest that integrating BST with a KM co-design has practical, systemic, and methodological implications for hauora Māori services. Practically, it points to ways iwi providers can strengthen digital capability for complex tasks such as immunisation coordination and outreach, without relying solely on external trainers or generic vendor-led modules (Te Whatu Ora, 2022; Immunisation Advisory Centre, 2025).

Systemically, it shows how behaviour-analytic tools can be reoriented through KM values so that they serve whānau aspirations and organisational kaupapa, rather than reproducing top-down, deficit-based models of “upskilling” (Kidd et al., 2021; Smith, 2012). Methodologically, it highlights the need for designs that better capture maintenance and generalisation over time, and that treat organisational realities, closures, system changes, and workforce pressures not as nuisances to be controlled away, but as core conditions that interventions must work within (Cooper et al., 2020; Pipi et al., 2002).

Implications

Overall, this project is an initial step toward a broader research collaboration in which kaupapa Māori and behaviour analysis are brought into dialogue to support digital, relational, and organisational capabilities in iwi health providers (Kidd et al., 2021; Rolleston et al., 2022). Future studies that build on this work, by using stronger single-case designs, explicitly programming for generalisation, and formally testing peer-to-peer training with BST (e.g., Parsons et al., 2013) could further clarify how these approaches can contribute to more responsive, culturally grounded immunisation services and wider hauora outcomes for whānau Māori (Cooper et al., 2020; Kidd et al., 2021).

Limitations

This study has several limitations that should be considered alongside the findings. Due to a procedural error within the experimental design the task analysis was withdrawn from training, resulting in a single baseline session per participant. This error weakens experimental control over task accuracy, as stable responding in baseline was not established before introducing BST. Likewise, a single session in the maintenance phase limits confidence that changes can be attributed solely to the intervention and whether skills were maintained over time (Johnston et al., 2020, 2020; Skinner, 1965). In the applied

hauora setting it was neither realistic nor ethical to ask kaimahi to stop using Indici, so Indici use outside of BST sessions was not controlled or measured. Ongoing everyday use may therefore have contributed to skill gains independently of, or interactively with, BST (Cooper et al., 2020). In addition, participants brought their own prior learning histories with specific on-screen stimuli e.g., interpreting an "×" icon as "close the window". This at times enabled participants to complete tasks accurately via alternative response paths that were not captured in the TAs, preventing them from reaching 100% mastery as defined by the TA. Highlighting the challenge of representing multiple valid responses within a complex digital environment (Barnard-Brak et al., 2023).

Conclusion

This research shows that when BST is held within a kaupapa Māori co-design approach, training stops being a technical exercise and becomes a means of realising iwi and whānau aspirations for tamariki wellbeing. By lifting kaimahi confidence and accuracy in Indici, the project strengthened the everyday access to clear and consistent information for whānau decision making. Kaimahi can work toward meaningful engagement which can be prioritised within a system that has too often failed to honour its obligations to Māori. The journey was complex and demanding; it involved negotiating organisational pressures, software limitations, and a tight study timeline, but it demonstrated that iwi providers can grow their own digital capability, on their own terms, while keeping whakawhanaungatanga, mana motuhake, and manaaki at the centre. In doing so, it offers a hopeful pathway for future collaborations where behaviour-analytic tools can be reshaped by kaupapa Māori values to serve, rather than constrain, Indigenous health futures: kāore he raru ki te tango i ngā rākau a te Pākehā, engari me noho tonu te manawa Māori - Tā Apirana Ngata.

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Appendices

Appendix A

Study Information Sheet

The study information sheet, see Figure 5, provided to participants regarding the purpose of the research, contact details of the Lead researcher, Human Research Ethics Committee number.

Figure 5

Participant Information Sheet for Research Project HREC(Health)2025#31

STUDY INFORMATION SHEET FOR KAIMAHI/STAFF

Study title:	A Behaviour Analysis approach to understand engagement with immunisation programmes in provincial/rural communities.		
Locality:	Taupō, Tūrangi, Mangakino	Ethics committee ref:	HREC(Health)2025#31
Lead investigator:	Danielle Squire	Contact phone number:	0273301490

What is the purpose of the study?

The University of Waikato invite you to take part in a research project that will take a behaviour analysis approach to understanding how kaimahi interact with technology i.e., Indici when supporting their engagement with whānau deciding to engage with an immunisation programme. With the University of Waikato, I will be looking to kōrero with whānau māori, kaimahi of both clinical and non-clinical backgrounds, to understand the engagement process when supporting the decision making process in immunisation kōrero.

- what are the barriers that impact engaging with whānau
- what are some of the experiences for kaimahi when engaging with whānau
- what are some of the experiences for kaimahi when providing health services and support in the whānau home, GP Clinic, and/or marae clinics
- how kaimahi would like to see the needs of whānau be met in the future
- how health services can be adapted in the future
- any other factors related to immunisations and your experience

This research project has been approved by the Human Research Ethics Committee (Health) at the University of Waikato as HREC(Health)2025#31. Any questions or concerns about the ethical conduct of this research may be sent to the Secretary of the Committee, email humanethics@waikato.ac.nz, postal address: Human Research Ethics Committee (Health), University of Waikato, Te Whare Wananga o Waikato, Private Bag 3105, Hamilton 3240).

What will my participation in this study involve?

Your participation will involve being a participant in a Behavioural skills training programme delivered by a university researcher in either the Taupō or Tūrangi office locations of your choosing. Participants will complete a pre and post questionnaire that will take approximately 5-10 minutes. Behavioural skills training can be as short or as long as you decide, but typically last around 1 – 1.5 hours. There number of training sessions will be open ended as training will cease once mastery of the skill has been achieved. A support person or work colleague are welcome to be present with you during the training. You can end the training at any time.

Training sessions may be recorded using a lead researchers phone to capture the session. This will help to capture additional data for observer reliability. The researcher will inform you if the training session will be recorded.
If you wish to take part and do not have any questions, please sign the attached consent form and email it to das26@students.waikato.ac.nz. If a consent form was mailed to you, you will be able to return it via a postage paid envelope. If you want to take part, but would like some questions answered, please contact the Lead researcher on 0273301490.

How will my information be kept private?

All training information will be confidential. Once you have consented to take part, you will be assigned a study ID. All data will be analysed under this study ID to assure your privacy and anonymity. No staff identifiers (names) will appear in any analysis, presentations or reports about this study. All aspects of the study will be strictly confidential and only the researchers involved will have access to your information. You have the right to see and amend your before and after questionnaire and feedback if you choose. On completion of the study, we can provide you with a report of the findings. If you would like to receive this report, please tick the box on the consent form.

What are the possible benefits and risks of this study?

There will be no risks to you in participating in this study. We hope that this study will result in better understanding of kaimahi support and access to training for when kaimahi and health services are providing health and immunisation services. We hope this research will help future kaimahi feel empowered to utilise health technologies to support with engagement with whānau and other health providers involved in immunisation programmes to help address health inequities in māori communities.

Who pays for the study?

No funding has been granted for this study.

What are my rights?

Your participation is voluntary (your choice). If you do not want to take part, please indicate 'no' or disregard this information. You are free to withdraw from the study at any time without giving a reason. This will not affect your continuing employment. If withdrawing, your participation data will be deleted up to 7 days after the last session of training.

Who do I contact for more information or if I have concerns?

If you have any questions, concerns or complaints about the study, you can contact:

Dr Tania Blackmore, Lecturer, University of Waikato
+64 7 837 9483
taniab@waikato.ac.nz

Danielle Squire
Master's Student – Applied Behaviour Analysis (ABA) Psychology
University of Waikato
0273301490
das26@students.waikato.ac.nz

If you have any questions about your rights as a participant, you can contact an independent health and disability advocate. This is a free service provided under the Health and Disability Commissioner Act.

Phone: 0800 555 050
Fax: 0800 2 SUPPORT (0800 2787 7678)
Email: advocacy@hdc.org.nz

For Māori health support please contact:
Te Puna Oranga Māori Health Service 07 834-3628

You can also contact The University of Waikato Human Research and Ethics Committee on:

Email: humanethics@waikato.ac.nz

Thank you for taking the time to read this Study Information Sheet and your consideration of participating in this study to help health providers understand how to support with decision making when engaging with immunisation services in New Zealand.

Appendix B

Consent for Contact by the University

A Consent for contact by a university researcher form, see Figure 6, were presented to participants ahead of recruitment. Participants were provided a form with the information study pack prior to recruitment commencing.

Figure 6

Participant Consent to be Contacted by the University Form

Participant's name: _____

Signature: _____ Date: _____

Phone number: ( ) _____ Email: _____

Best day and time to be contacted: _____

PLEASE RETURN THIS CONSENT FORM

Appendix C

Participant Consent Form

Consent form provided to participants during the recruiting process. These were all given as part of the information study pack to each participant as part of recruitment.

Figure 7

Participant Consent Form Given to Kaimahi/Staff at the Beginning of Study to Begin the Recruiting Process

KAIMAHI/STAFF CONSENT FORM

Study title: How to support whānau and kaimahi when health users and health services interact together for immunisation programmes. Where does behaviour change occur?

Principal investigator: Danielle Squire

I have read, or have had read to me, and I understand the Study Information Sheet.	Yes	No
I have been given sufficient time to consider whether or not to participate in this study.	Yes	No
I have had the opportunity to use a legal representative, whanau/ family support or a friend to help me ask questions and understand the study.	Yes	No
I am satisfied with the answers I have been given regarding the study and I have a copy of this consent form and information sheet.	Yes	No
I understand that taking part in this study is voluntary (my choice) and that I may withdraw from the study at any time without this affecting my medical care.	Yes	No
I consent to the research staff collecting and processing my information, including information about my occupation (e.g., information will be limited to ethnicity, non-clinical or clinical role, # of years working in health services, prior knowledge of Indici).	Yes	No
I have the right to withdraw from the study and to withdraw my information. I agree that the information collected about me up to the point when I withdraw may continue to be processed. If withdrawing,	Yes	No

your interview data will be deleted up to 7 days after completing the training session.		
I understand that my participation in this study is confidential and that no material, which could identify me personally, will be used in any reports on this study.	Yes	No o
I consent to my photo being taken if I am present in the room and in a non-identifiable way such as a group shot where the focus is on the presenter.	Yes	No
I consent to my photo being taken if I am present in the room and in a non-identifiable way such as a group shot where the focus is on the presenter, being used for the purposes of supporting reports or presentations.	Yes	No
I consent to being video recorded for the purposes of supporting data collection for observer reliability scores to support with data analysis purposes.	Yes	No
I know who to contact if I have any questions about the study in general.	Yes	No
I consent to my participation being recorded and understand my responsibilities as a study participant.	Yes	No
I wish to receive a summary of the results from the study.	Yes	No
If at any stage of the training I give you permission to reach out to my nominated support person Yes No My support person is aware I am participating in this project.	Support Person: Contact Number:	

Participant name: _____

Signature: _____ Date: _____

Phone number: ( ) _____ Email: _____

Best day and time to be contacted: _____

Declaration by member of research team:

I have given either a written or a verbal explanation of the research project to the participant and have answered the participant's questions about it.

I believe that the participant understands the study and has given informed consent to participate.

Researcher's name: _____

Signature: _____ Date: _____

Appendix D

Brief Kaimahi/Staff Pre-Training Questionnaire and Likert Scale

A pre-training questionnaire, see Figure 8, was provided to each participant to gather data of prior knowledge and experience with Indici. Information collected in this questionnaire helped to inform the development and modifications of the task analysis (TA) used for the baseline training session and additional TAs.

Figure 8

Participant Pre-training Questionnaire

Tuwharetoa Health

THE UNIVERSITY OF WAIKATO
Te Whare Wānanga o Waikato

Kaimahi Pre-Behavioural skills training Questionnaire

Introduction/Whakawhanaungatanga

- Thank the participant for their time and participation
- Ask about Karakia
- Introduce self/background including where from etc
- Respond to participants own introduction
- Answer any questions and ask participant if it's okay to start

Recap of Research Aims

- Explain aims of the research
- Verbally go through the information sheet and consent form, answer any questions/ clarify any concerns

End of Questionnaire

- Ask the participant if there is anything they would like to add to the answers given in the questionnaire
- Thank the participants for their time and participation
- Ask the participants if they would like to do a closing karakia

---

Questions	Responses	
1. The information in this form will remain anonymous and will only be shared if you agree to do so. Would you like to share your feedback to be used for the purposes of this research?	YES	NO
2. Are you in a clinical or non-clinical role? *Please circle one*	Clinical	Non-Clinical
3. What is the highest level of education or training you hold? *e.g., School Certificate/NCEA L1, Level 4 Certificate etc.*		
4. How long have you worked in the health sector?		
5. Have you used health technology or patient management systems before?	YES	NO
6. If yes, can you state what they were?		
7. Have you used Indici before? ➢ Current role ➢ Previous role/s	 YES YES	 NO NO
8. Did you receive training to learn Indici for your current role?	YES	NO
9. If you answered yes, was your training with an external facilitator, peer-to-peer, or online modules?		

10. How familiar are you with the different functions in Indici?				
1 Very Familiar	2 Familiar	3 I don't know	4 Not Familiar	5 Not Very Familiar

11. How easy is Indici to use to support your work?				
1 Very Easy	2 Easy	3 I don't know	4 Difficult	5 Very Difficult

12. Are there specific areas in Indici that you would like support with using?	

13. Have you identified any barriers in Indici that impact you in your role?			
14. What functions of Indici do you use in your current role? *Tick all that apply or use the space below to list any functions that are not listed here*	-Add new Patient -Timeline -Inbox -Activate -Deactivate -Tasks -Recalls -NOK -Prescribing Script Generation	-Notes -Recall admin list -Upload document -Contacts - … keywords -Family Tree -Validate NHI -SMS Reply Check -Alerts -Investigations -Letters and -Documents	-Mickey Mouse Account -Loading Immunisations -Patient Measurements -Patient Search -SMS Text Generation -NIR Status Query -SEHR with practice
15. Are there any of the functions in Indici you would like to know more about?			

16. Have you contacted Indici for user support or your external Indici support person?	YES	NO
17. If yes, can you specify who: Indici regional trainer, help desk, Indici Help tool online?		
18. Do you obtain consent to share records / immunisation status back to practice?	YES	NO
19. Does Indici help with your regular scheduling of work?	YES	NO

20. Do you feel confident to train new work colleagues in the use of Indici?

1 Very Confident	2 Confident	3 Unsure	4 Not Confident	5 Not very Confident

21. Are you comfortable using Indici as a health technology to support your work?

1 Very Comfortable	2 Comfortable	3 Unsure	4 Not Comfortable	5 Not very Comfortable

22. What would you like to be able to do through Indici to support your work?

Please list and give a brief description of how you use the software or use examples of how you use other software because Indici does not provide this option.

23. What kind of training do you prefer? *Can you list in order of preference*	**A)** Instructor and trainer **B)** Group setting **C)** Virtual Instructor led **D)** Self-paced **E)** Peer-led training	a. _____ b. _____ c. _____ d. _____ e. _____

Appendix E

Human Research Ethics Committee (Health) Approval Letter

Figure 9 provides details of the approval letter received for the research project to go ahead. Recruiting began with Tūwharetoa Health Charitable Trust soon after.

Figure 9

Approval Letter Received From Human Research Ethics Committee Health 2025 #31

The University of Waikato
Private Bag 3105
Gate 1, Knighton Road
Hamilton, New Zealand

Human Research Ethics Committee
Roger Moltzen
Telephone: +64021658119
Email:humanethics@waikato.ac.nz

THE UNIVERSITY OF WAIKATO
Te Whare Wānanga o Waikato

23 July 2025

Danielle Squire
School of Psychological and Social Sciences
By email: das26@students.waikato.ac.nz

Dear Danielle,

HREC(Health)2025# 31: A Behaviour Analysis approach to understand engagement with immunisation programmes in provincial/rural communities

Thank you for your responses to the Committee feedback.

We are now pleased to provide formal approval for your project.

Please contact the Committee by email (humanethics@waikato.ac.nz) if you wish to make changes to your project as it unfolds, quoting your application number with your future correspondence. Any minor changes or additions to the approved research activities can be handled outside the monthly application cycle.

We wish you all the best with your research.

Regards,

Emeritus Professor Roger Moltzen MNZM
Chairperson
University of Waikato Human Research Ethics Committee

Appendix F

Kaimahi/Staff Feedback Form

A post-training questionnaire and feedback form, see Figure 10, was provided to participants to collect subjective qualitative data regarding Behavioural skill training on five-point Likert scale.

Figure 10

Participant Post-training Feedback Form

Tuwharetoa Health

THE UNIVERSITY OF WAIKATO
Te Whare Wānanga o Waikato

Kaimahi Behavioural skills training Feedback Form

Introduction/Whakawhanaungatanga

- Thank the participant for their time and participation
- Ask about Karakia
- Introduce self/background including where from etc
- Respond to participants own introduction
- Answer any questions and ask participant if it's okay to start

Recap of Research Aims

- Explain aims of the research and the purpose of the feedback form

Closing / Whakakōpani

- Mihimihi to the Kaimahi for their time.
- Advise Kaimahi are able to change or redact their feedback at any time.
- Feedback will remain anonymous
- Present koha pack to Kaimahi
- Offer a closing karakia.

Āku mihi ki a koe. Thank you for your time for participating in the Behavioural skills training in the use of Indici.

It would be appreciated if you could please provide feedback on the training. In the space provided, if you feel comfortable please share what you found most useful and how you would like to see future training improved to support new kaimahi or help with refreshers when needed.

Are you happy to have this feedback included in the data results as part of the research analyses	Yes	No
I feel more confident using Indici in my daily work: *1: Very confident, 5 Not Very Confident*		

1 2 3 4 5
I have learnt more functions I can use in Indici to support my daily work: *1 Very True, 5 Not Very True* 1 2 3 4 5
I feel confident to train new colleagues in the use and functions of Indici: *1 Very Confident, 5 Not Very Confident* 1 2 3 4 5
I found the Behavioural skills training sessions easy to follow: *1 Very True, 5 Not Very True* 1 2 3 4 5
I feel more familiar with the purpose behind the Indici functions to support my work: *1 Very True, 5 Not Very True* 1 2 3 4 5
Please provide any additional comments or feedback about your experience:

Appendix G

Participant Demographic Information

Information presented was collected from the participant pre-training questionnaire. Details presented in Table 6 provides information regarding participant demographic data. Data was used to identify prior experience with health technologies.

Table 6

Participant Demographic Information

Question	Number of Participants (n)
Gender	
Female	6
Male	1
Ethnicity	
Māori	6
European	1
Other	-
Type of role	
Clinical	1
Non-clinical	6
Education Background	
No answer	2
School Certificate/*NCEA Level 1	2
Level 4 Certificate	1
Undergraduate Degree	1
Post-graduate Diploma	1
Number of years working in the health sector	
Less than 1 year	1
1 – 3 years	2
3 – 5 years	1
5 – 8 years	1
15 – 20 years	1
50+ years	1
Have used health systems before	
Yes	5
No	2
Have used Indici before	
Yes	7

No		-

Note. This table provides demographic data about each individual and their education, work experience and whether they had prior knowledge of Indici.

*NCEA refers to National Certificate of Educational Achievement and was introduced into New Zealand qualification system in 2002 replacing School Certificate.

Appendix H

Additional Participant Response Count Data to Pre-training Questionnaire

Information presented in Table 7 provides participant subjective rating familiarity, ease of use, and confidence using Indici. Ratings were provided on five-point Likert scales (1 = very familiar – 5 = not very familiar, 1 = very easy – 5 = not very easy, and 1 = very confident – 5 = not very confident). Data also identifies knowledge gaps of Indici use where task analyses were developed and modified with participants.

Table 7

Participant Subjective Responses to a Pre-training Questionnaire

Question	Participant responses
Did you receive training for Indici?	
Yes	7
No	1
Type of training provided	
Peer-to-peer	6
External Facilitator	1
Online Modules	-
Group Setting	-
Self-Paced training manual	-
No response	-
How familiar are you with Indici	
Very Familiar	1
Familiar	4
I don’t know	1
Not familiar	2
Not Very Familiar	-
How easy is Indici to use	
Very Easy	1
Easy	3
I don’t know	4
Challenging	-

Very Challenging	-
Functions of Indici used in current roles	
Add new patient	4
Timeline	4
Inbox	5
Activate	5
Deactivate	4
*Tasks	-
*Recalls	-
NOK (Next of Kin)	5
Prescribing Script Generation	-
Notes	5
Recall Admin List	-
Upload Document	4
*Contacts	1
..“keyword”	-
Templates	-
*Family Members	-
Validate NHI	3
SMS Reply Check	1
*Alerts	3
Investigations	-
Letters and Documents	2
Mickey Mouse Accounts	2
Loading Immunisations	2
Patient Measurements	2
Patient Search	5
SMS Text Generation	-
*NIR Status Query	1
SEHR with Practice	-
Are there any functions would you like to know more about?	
Yes	1
No	3
Only functions that will help me to do my role more efficiently	2
Other	3
Have you contacted Indici help desk for user support?	
Yes	1
No	7
Do you obtain consent to share records back to practice?	
Yes	1
No	7

Does Indici help you with scheduling your work?	
Yes	2
No	6
Do you feel confident to train new work colleagues in the use of Indici?	
Very Confident	1
Confident	3
Unsure	-
Not Confident	2
Not Very Confident	2

Note. *Indicates where training will be focussed to cover gaps in knowledge for supporting the immunisation service.

Appendix I

Qualitative Responses Given From Pre-training Questionnaire

Information presented in Table 8 give additional qualitative responses collected from participants. This information was used to identify prior health technology use and areas of interest relevant to participant roles and responsibilities.

Table 8

Participant Qualitative Responses Given From Pre-training Questionnaire

Prompt	Participant ID	Response to Question
Please state other health technology or patient management systems you have used before	*1*	*I have worked in hospitals (ED and ICU)*
	2	-
	3	-
	4	*Profile, Medtech, Indici*
	5	-
	6	*FS Net (Family Start Net)*
	7	*Indici, Hauora ERP, CareCall*
	8	*Indici*
	1	*No*

Are there specific areas in Indici that you would like support with using?	*2*	*Only use Indici for client details and adding client notes.*
	3	*All features that would help me in my role.*
	4	*Query Builder*
	5	*No*
	6	*I would like to receive comprehensive training and/or support for the use of Indici.*
	7	*I only use basic functions. I'm sure there is plenty more to learn.*
	8	*No*
Are there any of the functions of Indici you would like to know more about?	*1*	*No*
	2	*Yes*
	3	*Recalls, Immunisations Alerts if due, SMS, Family Tree. Anything that would help me with bookings.*
	4	*Accounts – Invoice reconciliate our files.*
	5	*No*
	6	*I would like to be able to navigate my way through Indici with confidence.*
	7	*Only what is needed/required is preferred.*
	8	*No*
What would you like to be able to do through Indici to support your work?	*1*	*Support with creating confidential notes. I get uncomfortable with non-medical personnel viewing my Indici notes.*
	2	*Immunisation reports and understand report. How to print the immunisation section.*
	3	*Booking appointments. Adding a note for scheduled appointments.*

4	*Bulk funding, budget, ensuring invoicing prices flex the changes are being captured on Indici.*
5	*I enrol clients into OIS service and Well Child service. I upload documents, reactivate, deactivate clients, change client details, leave notes on their profile, use the alert tab.*
6	*Everything! I want to be able to use Indici without having to ask someone else for help, because I don't know how to do it.*
7	*-*
8	*Recall, tasks, scheduling appointments, contact logs, .."keywords", templates, letters and documents*

Appendix J

Training Calendar for Participants

Table 9 provides the scheduling tool used to coordinate training sessions for the duration of the training programme. Participants indicated on the calendar availability for a training session with the Lead researcher. The Lead would then use the training schedule to send out outlook calendar invites to align with time blocks participants had selected.

Table 9

Training Calendar for Scheduling Participant Training Sessions

Taupō Office Training Sessions - November					
Taupō - Available Training Sessions					
Half hour time blocks	Monday 10	Tuesday 11	Wednesday 12	Thursday 13	Friday 14
7.45am - 8.15am				See session times below	
8.25am - 8.55am					
9.00am - 9.30am					
9.30am - 10am					

Every Thursday

Taupō Office - Thursday MORNING SESSIONS	
8.45am - 9.15am	
9.20am - 9.50am	
10am - 10.30am	

Tūrangi Office - Thursday AFTERNOON SESSIONS	
12.30pm - 1.00pm	
1.10pm - 1.40pm	
1.50pm - 2.20pm	
2.30pm - 3.00pm	
3.10pm - 3.40pm	
3.50pm - 4.20pm	

Training Sessions - November					
Taupō - Available Training Sessions					
Half hour time blocks	Monday 17	Tuesday 18	Wednesday 19	Thursday 20	Friday 21 *Consult 1
7.45am - 8.15am				See session	
8.25am - 8.55am					
9.00am - 9.30am					

9.30am - 10am			times below	

Thursday

Taupō - Thursday MORNING SESSIONS	
9.20am - 9.50am	
10am - 10.30am	
11am - 11.30am	

Tūrangi Office - Thursday AFTERNOON SESSIONS	
12.30pm - 1.00pm	
1.10pm - 1.40pm	
1.50pm - 2.20pm	
2.30pm - 3.00pm	
3.10pm - 3.40pm	
3.50pm - 4.20pm	

Training Sessions - December					
Taupō - Available Training Sessions					
Half hour time blocks	Monday 24	Tuesday 25	Wednesday 26	Thursday 27	Friday 28
7.45am - 8.15am					
8.25am - 8.55am					
9.00am - 9.30am					
9.30am - 10am					

Taupō - Wednesday Afternoon sessions	
1.15pm	
1.30pm	

Training Sessions - December					
Taupō - Available Training Sessions					
Half hour time blocks	Monday 1	Tuesday 2	Wednesday 3	Thursday 4	Friday 5
7.45am - 8.15am			See Session times below	See session times below	
8.25am - 8.55am					
9.00am - 9.30am					
9.30am - 10am					

Wednesday

Tūrangi- Wednesday MORNING SESSIONS	
7.45am - 8.15am	
8.25am - 8.55am	
10.10am - 10.40am	

Taupō - Wednesday AFTERNOON SESSIONS	
1.25pm - 2.pm	
2.00pm - 2.30pm	

10.50am - 11.20am	
12pm - 12.30pm	

Taupō - Thursday MORNING SESSIONS	
7.45am - 8.15am	
8.15am - 8.45am	
8.45am - 9.15am	
9.20am - 9.50am	
10am - 10.30am	

Tūrangi Office - Thursday AFTERNOON SESSIONS	
1.10pm - 1.40pm	
1.50pm - 2.20pm	
2.30pm - 3.00pm	
3.10pm - 3.40pm	
3.50pm - 4.20pm	

Training Sessions - December					
Taupō Available - Training Times					
Half hour time blocks	Monday 8	Tuesday 9	Wednesday 10	Thursday 11	Friday 12
7.45am - 8.15am				See session times below	
8.25am - 8.55am					
9.00am - 9.30am					
9.30am - 10am					

Taupō - Thursday MORNING SESSIONS	
9.20am - 9.50am	

Tūrangi Office - Thursday AFTERNOON SESSIONS	
12.30pm - 1.00pm	
1.10pm - 1.40pm	
1.50pm - 2.20pm	
2.30pm - 3.00pm	
3.10pm - 3.40pm	
3.50pm - 4.20pm	

Training Sessions - December					
Taupō - Available Training Times					
Half hour time blocks	Monday 15	Tuesday 16	Wednesday 17	Thursday 18	Friday 19

7.45am - 8.15am			See Session times below	See session times below	
8.25am - 8.55am					
9.00am - 9.30am					

Taupō - Wednesday MORNING SESSIONS	
8.45am - 9.15am	
9.20am - 9.50am	
10am - 10.30am	

Taupō - Thursday MORNING SESSIONS	
8.45am - 9.15am	
9.20am - 9.50am	
10am - 10.30am	

Tūrangi Office - Wednesday AFTERNOON SESSIONS	
12.30pm - 1.00pm	
1.10pm - 1.40pm	
1.50pm - 2.20pm	
2.30pm - 3.00pm	
3.10pm - 3.40pm	
3.50pm - 4.20pm	

Tūrangi Office - Thursday AFTERNOON SESSIONS	
12.30pm - 1.00pm	
1.10pm - 1.40pm	
1.50pm - 2.20pm	
2.30pm - 3.00pm	
3.10pm - 3.40pm	
3.50pm - 4.20pm	

Note. Where a time is blocked out in black indicates a no training block due to organisation requirements or the Lead being unavailable for training.

Appendix K

Task Analysis – Initial Task Analysis for Baseline

Table 10 provides the steps and areas of work flow used in the initial task analysis (TA) used for baseline. Subsequent TAs were co-developed and modified with participants based on core responsibilities and work functions. This TA was only used for the single session in the baseline phase.

Table 10

Task Analysis – Baseline Phase

Area of Workflow 1: Login, Checking Tasks from Home Dashboard

1. Login to user profile
   - Username
   - User password
2. Open *Home* dashboard
   - Icon in top left of screen
3. Locate Task label in left panel of home screen, select *Tasks*
   - Tasks table will populate in middle of screen
   - Active assigned tasks will be visible to user
4. Hover cursor over *patient name* of active task
   Selecting the task will direct user to the patient file
5. Read task instruction and complete required work
6. To close window, select *save* to proceed with work
   if task is now completed, select *complete* button in bottom left of task window. This will remove task from active task list.
   - If additional work is to be completed in task, update task details in note field
7. Set new *due date* in task
8. Select *save* to close task window

Area of Workflow 2: Patient Search and Information Check.

9. Search patient in search field in top-centre-right of screen
   - Name search
10. Patient's file link will populate in the patient history list. Select *patient's name*
    - Upon selection, patient file will populate on-screen
    - User is now in the patient file

- If patient name populates on-screen but has a ~~strike through~~, reactivate patient
  - Select *patient file*
  - Select *patient edit*
  - Scroll to bottom of patient details and find a check box *Active* and select
  - Select *finish and go to consult*
  - Patient is now reactivated

If no record populates on-screen go to loading new patients into Indici Area of workflow 4

11. Locate patient details in green ribbon along the top of the patient file and check information is correct:
    - Name
    - Date of Birth
    - Address
    - Gender
    - Ethnicity
    - Parent/Caregiver names included with contact numbers
      - Parent/Caregiver names will be visible when the cursor is hovered over the *share* icon
      - If no share icon is visible, details have not been entered on patient enrolment
12. Select family members icon to check patient next of kin (NOK) details are entered.

Area of Workflow 3: Enrolling New Patient's into Indici and Making Active

13. Search patient name in search engine located in the top centre-right of screen
    - If no name populates try *advance search* with the same name
14. *Search vault* for historical enrolments
    - A new window will populate on-screen asking "do you want to search the vault", select *yes*
    - If there is an historical record the patient file link will populate on-screen
15. If there is no record select the *Add Confirmed Enrolled / Other* label
    - A new window will populate on-screen

16. Follow the instructions on-screen by including the details in the enrolment form into the required fields on-screen ensuring to complete all fields marked with a red *
    - At the end of the form select *save to continue*

17. If an NHI has been included in the enrolment form select button *Validate NHI*
    - A new window will populate with details of the patient already saved in various fields on-screen. Select all the corresponding fields that match the enrolment form and select *save*
    - You will be returned to the patient demographic details page where some of the fields are now pre-populated

18. Fill in all the appropriate fields that correspond to the enrolment form that are missing information
    - Parent names and contact details
    - Next of Kin (NOK)
19. If address in enrolment form is different from that shown in the Validate NHI window you will need to validate address.
    - Select into *find* field and start typing address shown on enrolment form
    - Address will populate on-screen. Select the *address*. The corresponding fields will now auto-fill with the new address details.
20. Select *Save and Proceed*
21. Skip page 2, this page is not needed to finalise enrolment
22. Page 3 – change patient status to registered
    - Select down arrow and choose *registered*
23. Change registration date to *today's' date*
24. Patient Enrolment details
    - Change enrolment status to *enrolled elsewhere* by selecting down arrow
25. Residential status
    - Change to *New Zealand* or *Eligible Non-Citizen*
26. Select *Save and Proceed*
27. Page 4 – Enrolment at Tūwharetoa Health Charitable Trust
    - Change selections to
    - Yes – I am a New Zealand citizen, or
    - No – I hold a resident visa or a permanent resident visa
    - No – I am an Australian citizen or Australian permanent resident
28. Proceed to the bottom of the page on-screen. Change provider details to *Tūwharetoa Health Provider* by selecting the down arrow
29. Change default location to Tūwharetoa Health Charitable Trust by selecting the down arrow
30. Select *Finish and go to consult*
    - The screen will populate to the patient file

Area of Workflow 4: Checking for enrolled Family Members

31. Select the *Family Members* icon along the top of the patient profile
32. Identify if known family members have been linked
    - Known enrolled family members are not listed,
        - See step 33 for task instructions on how to create family member links

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Area of Workflow 5: Creating Family Member Links by Chart #

33. Select *Patient Edit* icon along the top of the patient file
34. Locate chart number: *IND-TWH-XXXXXXXXX*
35. Copy whole chart number

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36. Search for identified family member who is also enrolled as a patient with Tūwharetoa Health in patient search
    - Patient search is in top centre-right of dashboard
37. Select patient name listed in patient file log
    - Family members patient file will populate
38. Select *Patient Edit* within family member's profile
39. Locate chart number: *IND-TWH-XXXXXXXXX*
40. Select whole chart number including letters and numbers together
    - *Delete*
41. Select into field with cursor and paste original family members chart number.
42. Scroll to bottom of page and select *finish and go to consult*
    Page will close and return to the patient file dashboard, refreshing the page
43. Select *family members* icon – family link should now be visible
    - Repeat with all enrolled family members

Area of Workflow 6: NIR Status Query and Immunisation Schedule

44. In patient timeline, identify if a recent National Immunisation Register (NIR) status query is visible.
    - Search through consult notes in the *Timeline*, located in the right panel of the patient file. If there is a recent query in the patient consult you do not need to run a query. Proceed to step 49.
    - If NIR Status Query has not been actioned, then go to next step.
45. Select *Immunisation* label.
    - Left panel of patient file. Scroll through labels to find Immunisations.
46. NIR status query window will populate. Select *NIR Status Query* button, centre-right of immunisation dashboard.
47. Change age range from 0-*current age* in drop-down options and change search type to *wild card*
48. Select *NIR Status Query button* (*this takes approximately 15– 30 minutes to run the query)*
    - You will be returned to the immunisation schedule history log page

Area of Workflow 7: Immunisation Recall – Creating an Appointment

49. Select *recal*' label
    - Recall label can be found in lower left panel of screen
50. Find next immunisations event in the recall dashboard
    - A new table will populate in the centre of the screen with active recall dates
51. Select relevant *recall*.
    A new window will populate on-screen with the recall detail
52. Check provider details are correct
    - If Immunisation Kaitataki is listed as provider go to step 54
    - If provider details are incorrect, hover cursor over name in the provider field and highlight entire field. *Delete*

53. Change provider to Immunisation Kaitataki
    - Write name of correct provider in field and select *enter*. *Search Provider* window will populate on-screen. Select *provider name*. Screen will return to recall window.
54. Change recall group if details have auto-populated to vaccine schedule
    - Hover cursor over down arrow and select correct recall group header
55. Hover cursor over down arrow in description box. Select the correct immunisation description to match vaccine group details: *6W, 3M, 12M, 15M, 4*Y
56. Select *save*
    - User will be returned to active recalls table

Area of Workflow 8: Assigning a New Task to a Team Member

57. Select *task* label in patient file
    - Tasks table will populate in the centre of the screen
    - All active tasks will be visible to user
58. Select the *+* icon
    - Task window will populate in the centre of the screen
59. Write note regarding purpose of task into description box
60. Assign staff member to the task
    - You can start typing staff members name or select name via the drop down arrow to right of field. Select the *staff members name* and select *enter*
61. Find *Due by* field and select due date
62. Select *Save* button at bottom of window to save task
    - Task window will close returning user to patient file

Area of Workflow 9: Adding Service Alerts

63. Hover cursor over alert *+* in top left corner of patient dashboard
64. Select *alert* label from drop down options
    Add any additional details if necessary
65. Select s*ave* to close alert window

Area of Workflow 10: Creating Contact Logs

66. Select c*ontacts* label
    - Contacts dashboard will populate
67. Hover cursor over *+* sign to add a new contact
68. Hover cursor onto down arrow in category field. Select relevant category. *Immunisations*
69. Hover cursor over down arrow and select *yes* or *no* to determine if contact was made
70. Hover cursor over down arrow in outcome field. Select relevant outcome *i.e., booking made, other*

71. Check date and time reflect when the contact was made. *e.g., 12/11/2025, 10:30a.m.*
72. Hover cursor into note field and leave a brief note
73. Select *save*.
    Contact log will now be saved

Area of Workflow 11: Upload Documents to Patient File

74. Locate administration label along the top of the patient file
75. Hover cursor over the word *administration* until list populates below label
76. Scroll cursor down list locating *upload document* label and select
77. Upload document label will open within the browser
78. Locate *up arrow icon* in top right corner of dashboard and select
79. A window will pop up in the centre of the screen. Select *choose file*
80. Locate the file for uploading and select within file window. Then select *open*
    More than one file can be loaded at once. These will be loaded in bulk but separated by file name.
81. The file window will close and will reopen to the upload document window.
82. The file will populate in the left field of the dashboard with user name and file name showing.
83. Select the *file* in the left field required for loading to the patient file.
84. Select boxes *File* and *Post on Timeline*
85. Change *subject field* to name of document being uploaded
86. Search patient name and select
87. Preview document and cross-check name of patient and name of document match
88. If details match press *save*
89. Return to consult detail label in browser. Document will now be loaded to patient file.

Area of Workflow 12: Closing Referral, Informing General Practice (GP), Discharge Patient

90. Before closing referral back to GP, ensure consent has been obtained to share immunisation engagement back to enrolled GP.
    - Has consent been obtained via consent to share on enrolment form, carry on to step 1
    - If consent has not been obtained stop here
91. Select the *email icon* from the outbox label
92. Send *email (private)* dashboard will populate
    - Enter email address into *email* field
93. Subject line *Tūwharetoa Health OIS*

94. Select OIS template from drop down options
    - update template where necessary
95. Review details in email. If satisfied with notes and consent to share is obtained. *Send Email (private)*
96. Check status of email in outbox label
    - Record of email will be retained in outbox

97. In patient file, select *Patient Edit* icon

98. Scroll to bottom of page and find select box with tick next to Active.
    - *Deselect* icon
99. Scroll to bottom of page and select *save and go to consult*
    - A new window will populate asking if you would like to close any remaining recalls. Select *yes*
100. The patient is now discharged and inactive in Tūwharetoa Health Indici

Note. If participants were familiar with an area of workflow and had developed new skills via generalisation, the observable step was marked an incorrect zero score (✕ mark) for not following the steps in sequence. A correct score was given of 1 (✓ mark) for subsequent steps if the participant then returned to the area of workflow to complete the remaining steps. NOK = Next of Kin, NIR = National Immunisation Register, NHI = National Heath Index, IND-THW-XXXXXXX= Indici-TūwharetoaHealth-Chart#, OIS – Outreach Immunisation Service

Appendix L

Post-training Subjective Responses Participant Feedback

Participants provided feedback regarding their subjective experiences with behavioural skill training (BST) and are presented in Table 11. Participant confidence levels were given using a five-point Likert scale, with an additional question on whether participants would recommend BST as a form of training to others.

Table 11

Subjective participant responses rated on a five-point Likert Scale for five areas of Behavioural Skill Training.

Five areas of BST rated on a five-point Likert scale	Response rating given per participant (*n*)				
	Strongly Agree	Agree	Neither agree or disagree	Disagree	Strongly Disagree
I feel more confident using Indici in my daily work	100% (*7*)	-	-	-	-
I feel confident to train new colleagues in the use and functions of Indici	57.15% (*4*)	28.57% (*2*)	14.29% (*1*)	-	-
I found Behavioural skills training easy to follow	85.71% (*6*)	14.29% (*1*)	-	-	-
I feel more familiar with the purpose behind the Indici functions to support my work	85.71% (*6*)	14.29% (*1*)	-	-	-
I have learnt more functions I can use in Indici to support my daily work	85.71& (*6*)	14.29% (*1*)	-	-	-
Would you recommend this type [BST] of training to others to learn how to use Indici in their work?	100% (*7*)	-	-	-	-

Appendix M

National Immunisation Schedule

Participants were given access to a copy of the National Immunisation Schedule (NIS) (see Figure 11) if they were unsure how this aligned with Indici and the NIR. The handout was available for all training sessions.

Figure 11

National Immunisation Schedule (NIS) Representing age Milestones for Childhood Immunisations.

The National Immunisation Schedule

From – **August 2025**

Stages	Disease to protect against	Vaccine
Pregnancy	Tetanus + diphtheria + whooping cough (pertussis)	Boostrix®
	Influenza	Brand varies
6 weeks	Rotavirus	Rotarix® (oral) (first dose must be given before 15 weeks)
	Diphtheria + tetanus + whooping cough (pertussis) + polio + hepatitis B + Haemophilus influenzae type b (Hib)	Infanrix® hexa
	Pneumococcal disease	Prevenar 13®
3 months	Rotavirus	Rotarix® (oral) (second dose must be given before 25 weeks)
	Diphtheria + tetanus + whooping cough + polio + hepatitis B + Haemophilus influenzae type b (Hib)	Infanrix® hexa
	Meningococcal B	Bexsero® (can be given at 8 weeks)
5 months	Diphtheria + tetanus + whooping cough + polio + hepatitis B + Haemophilus influenzae type b (Hib)	Infanrix® hexa
	Pneumococcal disease	Prevenar 13®
	Meningococcal B	Bexsero® (can be given at 4 months)
12 months	Measles + mumps + rubella	Priorix®
	Pneumococcal disease	Prevenar 13®
	Meningococcal B	Bexsero®
15 months	Measles + mumps + rubella	Priorix®
	Chickenpox (varicella)	Varilrix®
	Haemophilus influenzae type b (Hib)	Act-HIB®
4 years	Diphtheria + tetanus + whooping cough + polio	Infanrix® IPV
11-12 years	Human papillomavirus (HPV)	Gardasil®9 (2 doses, 6 months apart)
	Tetanus + diphtheria + whooping cough	Boostrix® (from 11 years)
45 years	Tetanus + diphtheria + whooping cough	Boostrix®
65 years	Tetanus + diphtheria + whooping cough	Boostrix®
	Influenza	Brand varies
	Shingles (Zoster)	Shingrix® (2 doses, 2 - 6 months apart)

Te Kāwanatanga o Aotearoa
New Zealand Government

For more information visit
info.health.nz/immunisations

Health New Zealand
Te Whatu Ora

Appendix N

Participant Koha Kai Pack

In keeping with kaupapa Māori values, each participant was presented a kai pack, see Figure 12, on arrival to their training session. Kai packs were prepared ahead of each training session on the day of training.

Figure 12

Participant Koha kai Packs Presented at Each Training Session.

Appendix O

Koha for Participants at Conclusion of Training

Participants were presented with a small koha, see Figure13, at the conclusion of training. Koha was a home-grown plant potted with a small, laminated card with a karakia presented on each side. He iti te taonga, he pounamu.

Figure 13

Participant Koha Presented at the Conclusion of the Follow-up Session

Appendix P

Tikanga and Kawa for Training

Training sessions were facilitated using the training agenda, see Table 12, to ensure consistency of set-up and tikanga was followed consistently for all training sessions.

Table 12

Tikanga and Kawa Guide for Each Training Session so Ensure Consistency Across all Participants and Sessions

Training Equipment	- Laptop or Desktop Computer with secure user access to Indici - Keyboard - Mouse - Computer Stand - Chair - Desk - Tripod - Video recording device i.e., iPhone 12 - Printed step-by-step instructions - Pen	
Koha kai pack	- 2 pieces of Fruit - 3 pieces of confectionary - Muesli bar	- Instant Coffee Sachets - Cheese and Crackers
Offer to open the session with a karakia:	Whakataka te hau ki te uru Whakataka te hau ki te tonga Kia mākinakina ki uta Kia mātaratara ki tai E hī ake ana, te atākura He tio, he huka, he hau hū Tihei Mauri Ora	
Karakia mo te kai	Nau mai e ngā hua, e hora nei Nō te wao, nō te ngakinga, nō te wai tai, nō wai māori, Nā Tāne, Nā Rongo, Nā Haumie, Nā Maru Ko Ranginui e tū nei, Ko Papatūānuku e takoto nei Tūturu whakamau a kia tīna – tīna Haumi e, hui e, taieki e	
Whakawhanaungatanga	Check in and see how kaimahi are doing. Ask if feeling ok to go ahead with training session. Discuss process of withdrawing.	
Additional information for participants in each session	- Will aim to be no longer than 30 minutes - Will be recorded. Check kaimahi are still ok with this. - Explain video will be pointed at the computer screen only. - Session will be stopped if clear steps can't be completed or if kaimahi requests to finish session early	
Offer Karakia to whakawātea	Whakairia ai te tapu Kia wātea ai te ara Kia turuki whakataha ai Kia turuki whakataha ai Haumi e, hui e, taieki e	
Mihi ki te kaimahi Acknowledgement to the kaimahi for their time. Give details of next session together and check time still works. Advise that a reminder text message will be sent the day before to provide opportunity to reschedule if needed.		