The effectiveness of a co-designed, culturally-tailored mHealth tool to support healthy lifestyles in Māori and Pasifika communities in New Zealand: Study protocol of a cluster-randomised controlled trial

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Abstract

Objectives New Zealand urgently needs scalable, effective healthy lifestyle support programmes tailored to the needs and lived contexts of Māori and Pasifika communities. The primary objective of this study is to determine the effects of a co-designed, culturally-tailored, lifestyle support mHealth tool (the OL@-OR@ smartphone app and website) on key risk factors and behaviours associated with an increased risk of non-communicable disease (diet, physical activity, smoking and alcohol consumption) compared to a control condition.

Methods A 12-week, community-based, two-arm, cluster randomised controlled trial will be conducted across New Zealand January to December 2018. Participants (target n=1280; 64 clusters [32 Māori, 32 Pasifika]; 32 clusters per arm [16 Māori, 16 Pasifika]; 20 participants per cluster) will be individuals aged 18 years and older who identify with either Māori or Pasifika ethnicity, live in New Zealand, are interested in improving their health and wellbeing or making lifestyle changes, and have regular access to a smartphone, tablet or laptop/computer and to the internet. Clusters are identified by Community Coordinators and will be randomly assigned (1:1 ratio) to one of two groups: 1) the full OL@-OR@ app, or 2) a control version of the app (data collection only plus a once-weekly notification), stratified by geographic location (Auckland or Waikato) for Pasifika clusters and by region (rural, urban or provincial) for Māori clusters. All participants will provide self-reported data at baseline, and 4- and 12-weeks post randomisation. The primary outcome is adherence to healthy lifestyle behaviours measured using a self-reported composite health behaviour score at 12 weeks, that assesses smoking behaviour, fruit and vegetable intake, alcohol intake, and physical activity. Secondary outcomes include self-reported body weight, holistic health and wellbeing status, medication use, and recorded engagement with OL@-OR@ tool.

Discussion Currently there are no scalable, evidence-based tools to support Māori or Pasifika who want to improve their eating habits, lose weight, or be more active. This wait-list controlled, cluster randomised trial will assess the effectiveness of a co-designed, culturally tailored mHealth tool to support healthy lifestyles.

**Introduction**

New Zealand (NZ) is ranked third in the developed world for obesity rates, with almost one in three adults in New Zealand being obese (31.2%) [1]. Substantial ethnic health inequities exist, with Māori (indigenous New Zealanders; 15% of total population) and Pasifika (collective group of people representing different Pacific Island nations predominately from the South Pacific region; 7% of total population) adults living in NZ experiencing obesity rates 1.7 and 2.4 times higher respectively than those of non-Māori, non-Pasifika adults [2].

High body mass index is now the second-ranked risk factor after unhealthy diet for the NZ population, accounting for 9.2% of total Disability-Adjusted Life Years (DALYs) [3]. Moreover, Māori and Pasifika living in NZ experience a greater burden of obesity and diet-related disease [3]. The scope and scale of this problem indicate an urgent need for scalable, evidence-based interventions to support individuals in communities to eat more healthily, lose weight, or be more active. Culturally-tailored lifestyle support interventions have shown beneficial effects [4-7]. Nevertheless, funding pressures have made it difficult to sustain such tailored interventions and support communities with ongoing health promotion activities.

The broad population penetration of mobile and wireless technologies and advancements in their application offers a potential solution. Ninety two percent of New Zealanders own a mobile phone (67% owns a smartphone [8]) and 80% have internet access [9]. Further, there are no significant differences in smartphone ownership or internet access by ethnicity or education, and few differences by age (for those <65 years) [8]. Formative research in NZ indicates the majority of Māori would be keen to use a mobile health (mHealth) intervention for weight loss, and systematic reviews indicate mHealth interventions can lead to behaviour change [10-14].

mHealth programmes - i.e. the usage of mobile and wireless technologies designed to achieve medical objectives [15] - have been shown to effectively help people change various health behaviours [11,16-21] and improve other secondary risk factors for cardiovascular diseases, such as blood pressure and medication adherence [22]. Nevertheless, most mHealth programmes are designed with minimal input from end-users and lack tailoring to cultural needs. As a result such interventions often have poor uptake and low rates of use by these communities and end-users [23].

The OL@-OR@ (pronounced “ola ora”) project consists of two stages, a co-design phase and a trial phase. The co-design phase focused on the development of a culturally-tailored,
lifestyle support mHealth tool (smartphone app and website) for Māori and Pasifika communities in New Zealand (conducted between June 2016 and October 2017). We have provided an overview of the main co-design principles, methods and processes elsewhere (manuscript under review). Also, the findings of thematic analysis of qualitative data gathered during the co-design phase with Māori [24] and Pasifika (manuscript under review) communities have been reported elsewhere. Subsequently, a systematic and theory-driven approach was applied to the selection of relevant culturally-tailored behavioural determinants and change techniques, informed by the co-design data gathered (manuscript under review). The cluster randomised trial described in this protocol was finally co-designed to measure the impact of the OL@-OR@ mHealth tool on key preventable risk factors for non-communicable disease, specifically diet, physical activity, smoking, and alcohol use.

Methods

Co-design
The trial was designed using the same participatory co-design principles that underpinned the first phase of the OL@-OR@ study. For this research study, an academic-community partnership has been established guided by principles of participation and protection and aligning with New Zealand’s Treaty of Waitangi [founding document]. Māori (i.e. “kaupapa”) and Pasifika-specific research approaches have been applied throughout the design of the mHealth tool and the trial [24]. Toi Tangata, a Māori health promotion provider, led the engagement process with Māori (involving communities in the Wellington and Auckland regions) and two Pasifika health providers, The Fono in Auckland, and South Waikato Pacific Islands Community Services Trust in Tokoroa led engagement processes with their local communities. This paper focuses on the OL@-OR@ trial phase. During several hui [meetings] attended by Māori and Pasifika community representatives and academics, decisions were made regarding the trial design, including the community-based cluster trial design, the control condition, primary and secondary outcome measures, recruitment methods, and timelines.

Study design
This trial protocol adheres to the SPIRIT guidelines (Appendix 1). A two-arm, parallel, cluster randomised controlled trial will be conducted in New Zealand between January and December 2018. A total sample size of 1280 participants will be recruited from 64 clusters [32 Māori, 32 Pasifika]; 32 clusters per arm [16 Māori, 16 Pasifika]; 20 participants per cluster.
Eligibility criteria
Clusters consist of Māori or Pasifika groups or communities identified by the community partners. Individual participants are eligible if they are a member of a participating cluster, reside in New Zealand, are aged ≥ 18 years, have regular access to a smartphone, tablet, laptop or computer, have regular access to internet (at least once a week), are able to provide written consent (e-consent), and have an email address or are prepared to create an email account. Although people within clusters may self-identify as both Māori and Pasifika, for the purposes of the analysis they will be recorded as Māori if they are part of a Māori cluster and Pasifika if they are part of a Pasifika cluster.

Recruitment
Recruitment will be community-led, i.e. Māori and Pasifika community coordinators will identify eligible clusters and will approach a potential cluster lead within these clusters. Once initial contact has been made with the identified cluster leads, they will be given information on what is required to be involved with the study, including outlining the process of being randomised to control or intervention conditions. Cluster leads will then provide informed consent for participation of their group or community in the study. The next step will be for the cluster leads to start recruiting participants for the trial. Specific recruitment methods will include:

- Inviting potential participants to face-to-face information sessions on the trial;
- Using social media, e.g. Facebook;
- Using posters, brochures and other advertising material;
- Word of mouth;
- Inviting established networks and groups previously formed with the community partners.

Potential participants will also be able to enrol in the trial if they are invited by an existing trial participant via the OL@-OR@ app or if they share a phone with a trial participant who has downloaded the OL@-OR@ app on that phone.

Study procedures
People who are identified as part of a cluster by their local community coordinator will be invited to participate in the study. An information meeting will be organised to provide information about the study and answer any questions potential participants may have. Potential participants will be provided with a copy of the Participant Information Sheet and
brochure. Those who are interested and meet the inclusion criteria may sign up for the study with their local community coordinator. Potential participants who indicate interest will be sent an email with study registration details. By clicking on a link in the email they will be able to complete their registration details and provide e-consent (participants consenting using computer based consent form). They will then complete baseline questions online. Once all questions are complete and terms of use are accepted, participants will be able to download the OL@-OR@ app (intervention) or a data collection version of the app (control) on their device. If they do not have a smartphone or tablet participants will be able to access a web version through a link provided. All participants will be asked to use the app (or web version) for 12 weeks and keep the app running on their device for (at least) the whole 12-week period. At 4- and 12-weeks, online follow-up assessments will take place. After 12 weeks, participants in intervention clusters can continue using the app if they wish. Participants assigned to the wait-list control condition will be able to download the full app or use the web version once they have completed the 12-week questionnaire.

Randomisation, allocation concealment and blinding
Clusters will be randomly assigned in a 1:1 ratio to either the intervention or control condition, using a computer-generated randomisation list prepared by the study statistician. Block randomisation will be used with variable block sizes of 2 and 4, stratified by locality (Auckland, Waikato) for Pasifika clusters and by region (rural, urban or provincial) for Māori clusters to ensure these factors are balanced across two randomised groups. The randomisation list will be concealed until the point of randomisation for all clusters; randomisation codes will be kept secure in a restricted computer-based project file and only accessible by the project manager and project coordinator who will disclose these to community coordinators when clusters have been identified and signed their agreements. Due to the nature of the intervention it will not be possible to blind participants or research staff to the use of the different intervention conditions (full versus basic (data-collection only) version of the OL@-OR@ tool).

Study intervention
The OL@-OR@ tool is designed to help Māori and Pasifika and their whānau [extended family] to improve their health and wellbeing by making small positive, culturally relevant changes to their lifestyle. Various co-design methods were used to collaboratively capture and understand the needs of members of Māori and/or Pasifika communities. These methods fostered expression, reflection and sharing, and informed the development of the intervention.
Ethnic-specific models of health and wellbeing [25-28] were used to interpret the co-design data and to select relevant enablers and barriers of health behaviour change, behaviour change techniques, and intervention features that align with the cultural needs and wants of its users. The Theoretical Domains Framework [29] and Behavioural Change Taxonomy [30,31] were used to map similarities and differences in identified behavioural determinants and change techniques which confirmed that the OL@-OR@ intervention aligns with evidence-based behaviour change principles (manuscript under review) [32].

The tool supports users to set goals and specific steps to reach those goals. Users are encouraged to invite others to join them on their journey and can collect online reward tokens as they achieve their goals. The tool also provides information about healthy eating, physical activity, local activities and health services. Lifestyle trackers help users monitor their progress. Regular culturally-tailored reminders and motivational messages (4-5 messages each week) are sent to help users reach their goals. At the beginning of each week a whakatauki [motivational message] will be sent (one per week). Lifestyle messages including (culturally-tailored) tips on eating more healthily, doing more physical activity, reducing stress, improving sleep and weight loss will be sent once per week. Also, any participants who report that they smoke, will receive messages about smoking cessation once per week. Participants will also receive messages highlighting how to use specific features of the tool (once a week) and goal reminders at the end of each week reminding them to review or set new goals.

**Control condition**

Clusters assigned to the control condition will receive a basic version of the OL@-OR@ tool. This basic version of the tool will only collect data and provide a weekly motivational message thanking participants for taking part in the study and counting down the weeks until they receive the full OL@-OR@ tool. At the end of the study, when all assessments are completed, participants in the control clusters will be able to download the full OL@-OR@ tool to use for as long as they wish.

**Recompense for involvement in the study**

To acknowledge participants’ time and involvement in the study koha [gift or donation] will be available for each cluster (NZD 500 per cluster of 20 participants; pro-rated per number of participants recruited for clusters of fewer than 20 participants). The community partners will decide the best way to provide koha to the communities involved e.g. provision of a voucher, cash for the community, donation to a named charity, or purchasing of equipment for the community. Some clusters may elect to share the koha equally between enrolled participants.
Baseline assessments

At baseline, the following data will be collected from each cluster:

- Community type, including, for example, a church community or a sports club;
- Predominant ethnicity in community;
- Approximate number of members in the community;
- Approximate number of cluster members interested in participating in the study;
- Cluster lead and contact details.

In addition, the following data will be collected at baseline from each study participant:

- **Socio-demographic data:** date of birth, gender, ethnicity, *hapu* [Māori sub-tribe] and *iwi* [Māori tribe] (where relevant), highest education level, and annual household income;
- **Anthropometry:** self-reported weight (in kilograms) and height (in centimetres);
- **Health status:** self-reported health condition(s) defined as being told by a doctor that they have high blood pressure, high cholesterol, diabetes, and/or heart disease;
- **Physical activity:** measured by the Godin Leisure Time Physical Activity Questionnaire [32];
- **Smoking behaviour:** Measured by 7-day point prevalence of self-reported smoking abstinence [33];
- **Alcohol intake:** Measured by the Alcohol Use Disorders Identification Test Consumption (AUDIT) [34];
- **Fruit and vegetable consumption:** Measured by items used in the New Zealand Health Survey [35];
- **Kava consumption:** questions include ‘Do you consume Kava?’, ‘How often do you consume Kava?’, and ‘How many Kava drinks do you consume in a typical week?’;
- **Holistic wellbeing (for Māori participants only):** *Tūhononga* [cultural connections], *Mauri* [life force or essence], wellbeing, *whanaungatanga* [family wellbeing and social connectedness] and *Rangatiratanga* [self-determination, motivation and management], measured by 16 questions informed by Māori health models *Te Whare Tapa Whā* [28] and *Te Pae Mahutonga* [27] and adapted in part from the *Hua Oranga* Māori mental health assessment questionnaire [26]. Answers are measured on a 6-point Likert scale;
- **Holistic wellbeing (for Pasifika participants only):** spiritual, physical, mental and family wellbeing measured by 10-items designed for the purpose of this study based
on the Fonofale Model [25], the Ottawa Charter and *Hua Oranga* [26]. All answers are measured on a 5-point Likert scale;

- **Pacific and Kiwi-New Zealand Heritage and Lifestyle (Pasifika participants only):** Attitudes and beliefs about Pacific and Kiwi/New Zealand heritage and lifestyle measured using an 8-item cultural affiliation questionnaire [36,37]. Answer categories consist of a 5-point Likert scale;

**Primary outcome measure**
The primary outcome for the trial is participant adherence at 12-weeks to recommended health guidelines, as defined by a self-reported composite health behaviour score based on the European Prospective Investigation into Cancer (EPIC)-Norfolk Prospective Population Study [33] and used in a previous trial evaluating the effectiveness of a mHealth-delivered comprehensive cardiac rehabilitation program [38]. This composite score includes: smoking (1 = not currently smoking; 0 = had ≥1 cigarettes in past 7 days); fruit and vegetable intake (1 = ≥5 servings daily; 0 = ≤4 servings daily); alcohol intake (1 = ≤13 units per week; 0 = ≥14 units per week); and physical activity (1 = ≥14 units of moderate-to-vigorous activity/week; 0 = ≤13 units of moderate-to-vigorous activity/week). Scores range from 0 to 4 based on the number of health guidelines met. Participants are classified as adherent if they score 3 or more out of 4 and non-adherent if they score 2 or less. These measures are assessed at an individual level but analysed and reported at a cluster level (as are the secondary measures).

**Secondary outcome measures**
Secondary outcome measures will be collected at 4 and 12 week follow-up assessments via a web-based questionnaire, and include the same health behaviour outcomes as those assessed at baseline (physical activity, smoking, alcohol intake, and fruit and vegetable consumption) and holistic wellbeing. At 12-week follow-up, user engagement and interaction with the smartphone app will be quantified using an Engagement Index [39]. The index is an adapted version of the Web Analytics Demystified visitor Engagement Index [40]. The original index comprised seven sub-indices (click depth, loyalty, recency, interaction, feedback, brand, and duration index). Although measuring all indices is ideal, the Web Analytics Demystified visitor Engagement Index protocol emphasises that the calculation can be adapted to suit the project [40]. Therefore, in line with a previous study assessing user engagement of an mHealth intervention [39], we will select relevant web metrics to develop a composite engagement index for users of the OL@-OR@ app. These metrics will include: (1) session duration, (2) page views per session, and (3) number of push notification. These metrics will be used to calculate the following sub-indices:

- **Click-Depth Index:** the number of pages participants view per session in the app;
• **Loyalty Index**: frequency of participants accessing the app after they commence the intervention;

• **Interaction Index**: Number of push notifications sent through the app that are opened;

• **Recency Index**: Time lag between each session the participant accessed the app;

• **Feedback index**: Self-reported 20-item measure of participant satisfaction with the app (questions relate to: ease of navigation, usefulness of information, helpfulness of notifications, and satisfaction with look of the app) [39].

The overall engagement index summarises the sub-indices from date of registration through to 12 weeks follow-up. The overall index will provide a score for each participant that measures overall engagement with the app during this period. Cut-off points will be developed based on the distribution of the total sample’s index scores using tertiles. Participants will then be categorised as either poorly, moderately, or highly engaged.

**Sample size**

Recruiting 640 participants (16 clusters per arm; 32 clusters in total) will provide 80% power at 5% level of significance (two-sided) to detect a between-group difference of 15% in the primary outcome at 12 weeks post randomisation, assuming the proportion of participants adherent to healthy lifestyle behaviours in the control group is 30% [38] and an intracluster correlation coefficient (ICC) of 0.05 [41]. The inflation factor is about 3, i.e. 1 + (40-1)*0.05, which inflates n=160 per arm in a standard RCT to n=480 per arm in a cluster randomized trial under the same assumption. However we aim to recruit 1280 participants in total from 64 clusters (32 Māori clusters and 32 Pasifika clusters). This sample size will provide 80% power for the analysis of Māori and Pasifika participants separately, if our recruitment target will be met.
Table 1. Schedule of enrolment, interventions, and assessments

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<tr>
<th>TIMEPOINT</th>
<th>STUDY PERIOD</th>
<th>Enrolment</th>
<th>Allocation</th>
<th>Post-randomization</th>
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*Note. NZ=New Zealand, *Pasifika participant only

Statistical analyses

Baseline data collected from all participants will be summarised by treatment group, overall and by ethnic-specific clusters (Māori and Pasifika). Information collected at the cluster level will also be reported. Continuous variables will be presented as numbers observed, means and standard deviations. Categorical variables will be presented as frequencies and percentages. Since any differences between randomised groups at baseline could only have occurred by chance, no formal significance testing of baseline differences will be conducted.

The effect of the intervention will be evaluated using an intention-to-treat (ITT) analysis, including all clusters and participants in the group they are randomised to, regardless of whether they receive or complete that treatment. The proportion of participants who are adherent to lifestyle change (≥3 of 4 behaviours) at the end of the 12-week intervention period will be compared between two treatment groups, using generalised linear mixed
models with a random cluster effect and adjusting for important baseline confounders. Missing participant data will be taken into account in the mixed model estimates by maximum likelihood, assuming they are missing at random. Similar regression analyses will be conducted on secondary outcomes using the link function appropriate to a continuous or categorical variable. Intra-cluster correlation coefficient will be estimated. Subgroup analysis will be conducted for Māori and Pasifika clusters separately. Statistical analysis will be performed using SAS version 9.4 (SAS Institute Inc., Cary, NC, USA). All statistical tests will be two-sided at a 5% significance level.

Engagement Index
Basic descriptive data analysis will be performed on the metrics and components of the engagement index as well as the final index score [39]. To analyse the index score, cut-off points will be developed based on the distribution of the index scores of the total sample using tertiles; participants will be categorised as either poorly, moderately, or highly engaged. Group comparisons between poorly, moderately, or highly engaged participants will be conducted using generalised linear mixed models. Additional analyses will be performed to determine the association between the index and socio-demographic characteristics of the participants, including their education level, ethnicity, age, annual household income, device type (Android or iOS), and system type (app only, web only, or app and web).

Data management
Data from the trial will be entered into the Drupal database at the study centre (National Institute for Health Innovation, The University of Auckland, New Zealand). Information about study subjects will be kept confidential in keeping with the obligations set out in the Privacy Act 1993, the Health Information Code 1994 and Section 22B to 221 of the Health Act 1956. Access to all study data will be restricted to research staff directly involved in conducting or monitoring the study. Confidentiality will be protected by the use of study registration numbers, and only aggregated and de-identified data will be reported. Computerised information will be password protected and hard copy information (such as cluster agreements) will be kept in a locked filing cabinet under the responsibility of community coordinators. All reports from the study will be written in a way such that no individuals can be identified. Paper records, electronic files, and source documents will be retained for 6 years from the termination date of the study, in accordance with the requirements of the Privacy Legislation and the Health (Retention of Health Information) Regulations 1996.
Ownership of data
Individual study data will remain the property of individual study participants. The study centre will have the responsibility for storage, protection and retrieval of study data. The University team will have the responsibility for the safe guardianship and use of the data in consultation with the wider project team. All access, analyses and dissemination of Māori-specific data will be the joint responsibility of the University team and the Māori Community Partners.

Ethical approval and informed consent
Ethics approval for the trial was obtained from the Northern B Health and Disability Ethics Committee of NZ (17/NTB/152/AM01; approved on 17/11/2017). Ethics approval for any amendments to the study protocol will be sought, prior to implementation of the changes (Information on the trial registry will be updated accordingly). Maintenance of confidentiality and compliance with the Privacy Act will be emphasised to all study participants. Participation in the study will be entirely voluntary and participants may withdraw from the study at any time without having to give a reason by contacting the research team. A Participant Information Sheet and Consent Form (Appendix 2) will be given to participants who are identified as being part of cluster by the local community coordinator during an information meeting. E-consent will be obtained at the time of registration once participants have had the opportunity to read the Participant Information Sheet and ask any questions to their local community coordinator or other members of the study team. If any participants suffer harm from trial participation (which is unlikely), they should be eligible for compensation via their private health or life insurance, or via NZ’s Accident Compensation Corporation scheme.

Trial governance
Trial governance includes a steering committee (on which all authors sit), and a trial management team who will manage the day-to-day processes of the trial, including data management. This trial does not meet two or more of the criteria for the need of establishing a Data Safety and Monitoring Committee [42].

Dissemination policy
Results will be disseminated regardless of the magnitude or direction of treatment effect. Dissemination will include adding trial results to trial registration within one year of trial completion, feedback to trial participants, publication in an international journal, national and international media releases (including Māori, Pacific and mainstream media channels) at the time of journal publication, and presentations to participating communities, and relevant local, national and international audiences (including Health service funders and providers). In NZ
this will include, but will not be limited to, the Ministry of Health, District Health Boards, Māori and Pacific health provider organisations, general Primary Health Organisations, non-government organisations, and health professionals. Criteria for authorship of any papers rising from the trial will be taken from the International Committee of Medical Journal Editors [43].

**Trial status**

The trial started recruitment on 22/01/2018 and is currently ongoing. Recruitment is expected to take six months (protocol version 3, 11/04/2018. Trial findings are expected to be available December 2018.

**Discussion**

Most mHealth interventions are designed with minimal input from end-users and lack tailoring to specific (cultural) needs [44]. A culturally-tailored mHealth tool (smartphone app plus website) aimed at supporting healthier lifestyles among Māori and Pasifika communities in New Zealand was co-designed by an academic and community partnership team [24]. This ground-up work informed a theory-driven approach to content development, including identification of key themes and content domains, selection of behavioural determinants and change techniques, and development of features and functionalities of the mHealth tool.

Comparative user-centred principles were applied to co-designing a community-led, cluster randomised, wait-list controlled trial to evaluate the impact of the mHealth tool on health behaviour change. As such, this project is engaging with communities in a meaningful way all through the research process, from development to evaluation of the mHealth intervention. This approach has not only resulted in an mHealth tool that aligns with the needs, wants and lived (cultural) contexts of Māori and Pasifika communities, it is also anticipated that this approach will increase engagement and empower communities to make positive changes to their lifestyles.

**Future directions**

Participants will be asked if they consent to data gathered in this trial being linked to the New Zealand Integrated Data Infrastructure (IDI) using their unique national identifier to facilitate longer-term follow-up and assessment of health information that may be influenced by this study, for example blood tests (blood glucose and cholesterol), visits to health professionals, and diabetes and heart disease medication use. The IDI is a large national database containing microdata about people and households in New Zealand. Data
is derived from a range of government agencies, Statistics NZ surveys, and non-government organisations. We have ethics approval to examine such data up to once per year for a maximum of five years after the study ends. All information will be anonymized and will not be linked to information that could identify participants. Written consent will be sought from study participants.

**Abbreviations**

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>AUDIT</td>
<td>Alcohol Use Disorders Identification Test Consumption</td>
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<tr>
<td>BCT</td>
<td>Behaviour change techniques</td>
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<td>NHI</td>
<td>National Health Index</td>
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<td>IDI</td>
<td>Integrated Data Infrastructure</td>
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<td>mHealth</td>
<td>Mobile Health</td>
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<td>NCDs</td>
<td>Non-communicable diseases</td>
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<td>NZ</td>
<td>New Zealand</td>
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**Disclosure of potential conflicts of interests**

The authors declare that they have no conflict of interest.

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**Authors’ contributions**

LTM, RF, AJ, RW and CNM conceived the original idea for the study and sought and obtained funding. MT, SD, TV, AH are the Māori and Pasifika community partners. They recruit clusters and liaise with the cluster leads in the study. SB, CP, MV, EH are the Māori and Pasifika cluster leads. They recruit and register participants for the study. JG is the project manager responsible for the day-to-day running of the project, DG is a PhD student on this project, MEAV is the research fellow, and YJ is the project statistician. This paper was written by MEAV with input from all co-authors. CNM is guarantor for this paper. All authors read and approved the final manuscript.

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References


