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Pasifika prediabetes youth empowerment programme: evaluating a co-designed community-based intervention from a participants' perspective

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ABSTRACT

This paper provides insights from a community-centre intervention study that was co-designed by youth, health providers and researchers. The aims of the paper were to highlight the effectiveness of a co-designed community centred diabetes prevention intervention, and to determine whether a culturally tailored approach was successful. The study participants ($n = 26$) were at risk of developing prediabetes and represented the working age group of Pasifika peoples in NZ (25–44-year olds). The community-centre intervention consisted of 8 weeks of community physical activity organised and led by the local youth, a community facilitator, and the community provider. Semi-structured interviews with each of the intervention participants using a Pasifika narrative approach (talanoa) was carried out. Each interview was transcribed, coded and analysed and compared using thematic analyses. The study highlights four major themes illuminating positive successes of the community-centre intervention programme, and conclude that co-designing interventions for Pasifika peoples, should be culturally tailored to meet the realities of the communities and require strong support from associated community providers.

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Introduction

In New Zealand (NZ), a diverse range of approaches have been used as preventative approaches among high risk groups of developing long-term conditions, including

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individual and community-based interventions targeting healthier lifestyles of diet, nutrition and physical activity (Swinburn et al. 2013; Kohlstadt et al. 2015; Ministry of Health 2016c). Centralised government initiatives from the Ministry of Health, such as Healthy Families NZ (HFNZ) (Ministry of Health 2016a) have been strengthening local prevention systems to make enironments healthier (i.e. not explicitly aimed at obesity), by gathering local knowledge from the different community sites. The Childhood Obesity Action Plan (Ministry of Health 2016b) have focused on reducing the obesity rates, and investigate the impact of the social determinants of health on the diverse realities of Māori (indigenous peoples of NZ) and Pasifika peoples (Durie 2003; Robson and Harris 2007). These are all important strategies in developing effective ways to live more healthier lives. However, lifestyle and policy-based preventative interventions need to take into account the community context, values, belief systems, and critically, the grass-roots realities experienced by its members. Research should better identify how communities can be activated into action, for the benefits of their own individual members, families and eventually, inform population health advancement.

Developing healthier lifestyle programmes at a localised level, that is, in communities, partnered with health services, has been shown to be essential in empowering underserved populations, particularly as it aims to understand and support behavioural changes leading to better health and wellbeing outcomes. Examples of localised programmes, such as Ngāti and Healthy (Tipene-Leach et al. 2013), and community church-based initiatives (LotuMoui Health programme) (Counties Manukau District Health Board 2010) emphasise the need for communities to be active stakeholders as part of the design and implementation of such programmes, to ensure long-term sustainability and momentum (Coppell et al. 2009). National-based preventative programmes and international studies addressing the type 2 diabetes (T2DM) burden primarily through lifestyle and behavioural changes (Tipene-Leach et al. 2013; The Human Nutrition Unit 2014) suggest successes with such approaches in reducing the progression to T2DM (Diabetes Prevention Program Research Group 2002, 2009). Small scale piloted projects in NZ have also shown the usefulness of community-based programmes that have enabled lifestyle behavioural changes (Habour Sport 2015; Wood and Johnson 2016). However, the common barriers and challenges highlighted by these programmes were: lack of time, programming, costs to participate, location of the programme, lack of education, and lack of support by family members or friends (Habour Sport 2015; Wood and Johnson 2016). In addition, indigenous and Pasifika peoples reportedly were less likely to continue to participate in these programmes due to a lack of cultural relevance (Habour Sport 2015).

There is a recgonised knowledge gap in the design of effective and equitable health programmes that can be tailored to priority populations, including pragmatic strategies to ensure engagement and effectiveness, whilst also considering ways to empower members to become advocates for healthier lifestyle changes in their own communities (Firestone, Funaki, et al. 2018; Firestone, Matherson, et al. 2018). Recently, *Mana Tū*, a health intervention programme was developed in response to social-cultural inequities among patients with high rates of T2DM (Harwood et al. 2018). The main learnings from Mana Tū showed that intervention capacity development should include relevant knowledge, skills and resources that are useful for life in general; working together

under a mutually agreeable framework for all constituents (i.e. individuals, families, the health service and system) towards a common goal, to improve short- and long-term social-health outcomes and finally; that the community provider uphold responsibilities to maintain the rights of indigenous and Pasifika peoples to ensure excellent healthcare, and to achieve personalised goals (Harwood et al. 2018). Another example; The WellText Study (Eyles et al. 2016) used culturally-relevant health models; Whānau ora (Ministry of Health 2011) and FonoFale (Pulotu-Endemann 2001) in developing the *OL@-OR@ mobile health* (mhealth) tool, where communities were at the forefront of the design, development and implementation of the mhealth tool (Te Morenga et al. 2018). The tool was prospectively tested in a nation-wide randomised control trial across more than 40 clusters of Māori and Pasifika peoples. The findings reported a high level of community engagement (during the co-design phase) and involvement in the use of the tool. The mhealth tool highlighted the pragmatic use, such as, health education and community engagement, as high priorities for the communities invovled.

In 2015, members of the current research team developed and piloted the youth programme among Pasifika youth aged 18–24 year olds from Wellington, NZ, using a community participatory-based research (CBPR) approach (Bell et al. 2016). The pilot study focused on empowering youth to develop health promotion action plans to increase their activities friends, families and communities into living more healthier lives, using a social media platform (Facebook). The learnings obtained from that study were integrated to a scaled-up research programme *(anonymised)* (current study), with a focus on reducing the risk of prediabetes among Pasifika communities, particularly, among working-aged adults. Prediabetes is a common condition in which blood glucose levels are higher than normal, but not high enough to be clinically diagnosed as T2DM. It is defined as having an haemoglobin A1C (HbA1c) between 41 and 49 mmol/mol (Coppell et al. 2013). Among obese adults (having a body mass index (BMI≥30)), more than 30% are expected to have prediabetes and without any intervention, the likelihood of progressing to T2DM is considered to be high (Coppell et al. 2013). The study included an empowerment programme and a co-design component that developed the public health promotion knowledge and skillsets of Pasifika youth to co-design a community-based intervention, focused on reducing the risk factors of prediabetes.

The study comprised three phases: Phase 1 focused on developing the capacity of the youth and two Pasifika community service providers undertaking a series of empowerment modules and co-design programming. Phase 2 involved implementation of an 8-week community-based intervention. The intervention was co-designed by the community youth and facilitators, who led the programme of activities (e.g. Group fitness classes and walking groups, data collection), at local community hall, on a weekly basis. The participants were also provided with healthier lifestyle education resources to assist their progress in the intervention. Further information and findings about the intervention will be published separately (Firestone et al. 2021). Phase 3 concentrated on the evaluation of the co-designed prediabetes intervention programme. It involved a 3-tiered evaluation process: (i) semi-structured interviews were held between the community facilitators and the intervention participations; (ii) focus groups with the youth and; (iii) key informant interviews with the community providers. This paper focuses on the findings from tier 1 of the evaluation process (semi-structured interviews). Findings from tiers 2 and 3 will be presented separately. The aim of this

paper was to conduct a process evaluation of the study's co-designed intervention (led by locally trained youth), and to describe whether a culturally tailored approach was pragmatically effective.

Materials and methods

There were a total of 32 participants who consented to participate in the intervention, however, only 21 participants consented to the face-to-face interview to evaluate the co-designed intervention. The intervention participants were eligible to take part in the intervention based on the following criterion, they: were overweight or obese; had high blood pressure; were physically inactive; self-identified as being Pasifika ethnicity; were aged between 25 and 44 years old; residents within the targeted community where the study was held and; motivated to make healthy behavioural changes. The overall project received ethical approval from the Health and Disability Ethics Committee (17/CEN/289), New Zealand.

Theoretical context

The overall research project and inherently the intervention programme were grounded contextually on the FaleFono model (Pulotu-Endemann 2001). This model differs from a Westernised viewpoint of health, because it takes on a holistic view of health, through empowering individual, family, and the community's' health and wellbeing encompassing spiritual, mental, emotional, physical, the family and the environment (e.g. community, church).

We used the talanoa approach, which is grounded in the phenomenology theoretical framework (Voaioleti 2006). *Tala* means to 'inform, tell, relate, command, and to ask or apply', and *noa* means of 'any kind, or ordinary … ' opportunity to consult about the conditions, that will bring enlightenment to both parties (Voaioleti 2006). Talanoa's philosophical stance allows for Pasifika knowledge, world-view definitions and aspirations to be acknowledged, whilst developing a theoretical basis (Prescott 2008). Although the providers and the research team had established a schedule of questions, we also encouraged our participants to be openly conversant about anything regarding the intervention that they perceived as being useful reflections and learnings. Given the community focus of the intervention programme and the uptake being led by Pasifika health providers and the youth, this approach was deemed to be culturally acceptable.

Data collection

The community facilitator and members of the research team co-developed a schedule of questions to examine three aspects of the intervention programme. The facilitators and the researchers refined the questions listed in Table 1, by piloting the schedule among a small group of Pasifika adults, to ensure that the questions were relevant, meaningful and targeted the evaluation aim of the study.

The face-to-face interviews were carried out over a period of three months to allow time for the facilitators to contact and follow-up with each participant. Each interview was 1.5–2 h in duration. The recorded interviews will be transcribed verbatim, and

Table 1. Evaluation schedule of questions.

Pre-Intervention
Did the participants understand the reasons behind the intervention?
Intervention
What worked or did not work during the intervention?
Sustainability of the Intervention
What was the level of support from the wider community (church, family members, etc) in encouraging the you to stay in the intervention?
How can the health provider continue with this intervention, as part of their service?

entered manually organised according to topical codes. The data was analysed in accordance with the six phases of thematic analysis development (Braun and Clarke 2006) to achieve saturation of themes, determined through the use of open coding process and thematic development. Thematic analyses used a combination of inductive (i.e. provides a rich description of the data) and deductive (i.e. provides a thorough analysis to achieve the study objectives) reasoning approaches. Independent coding and consistency checks was undertaken by an independent researcher to ensure data credibility and saturation of themes. Eight of the 21 transcripts were translated from Tongan to English. The transcripts and themes and codes were sent to our community partners for participant verification and amendments. Our participants validated both the transcripts and themes of the research analysis. Four key themes, subordinate themes and cross-cutting nuances were derived from the transcripts.

Results

Themes from the interview data

Following the comparative analyses, the following tables highlight the key themes, which have been categorised by the sub-headings outlined from Table 1. Each table describes a major theme, supported by its key sub-themes and nuances explained, and where necessary selected participant quotes have been used to add depth to the meaning of the sub-themes.

Learning about health conditions, like prediabetes, was an objective of the overall project. The main reason behind peoples' decision to join the intervention was based on accessibility, and 'collective action', as a motivating factor to participate in a community-based activity.

Major theme 1: Understanding the purpose of the intervention programme

Understanding the purpose of the intervention programme
The participants understood that lifestyle focused on all aspects of health, including: physical health (physical exercise), mental/emotional (keeping a strong and positive mindset to succeed), social health (socialising with friends and family), and spiritual health (maintaining close links with church, morality and beliefs).
'I think it [intervention] sort of targeted the sort of lifestyles that we live as Pacific Islanders, and so it pinpoints what we really need to change or work at in our lifestyles going forward.'
'So its better to be educated and prevent … and to help save you from actually um falling into the condition on diabetes.'
Participant expectations
The majority of the participants were motivated to take part in the intervention for the sake of community fellowship, and to support the efforts of the youth who were leading it. The mutual benefits of being motivated and to support the community, was efficacious for both the individual and the community-research partnership.
' … my expectations for me to come out fully aware and the importance of good dieting, exercise, drinking lots of water

especially for me to cut out the fizzy.'

'I did have some sort of an idea when the youth approached me, I was keen to give it a go. … really just wanted to keep active and support our youth'

Accessibility to the intervention

All participants reported that the intervention was highly accessible for several reasons: the **venue** was community-based so participants could access the programme; **familiarity; regularity**; and there were no associated **costs** (free fruit and water was available).

'What worked for me was having a regular day, same time, same place, was very handy, so it became a routine for my family that on Thursday at 7 o'clock we were going to attend. That worked, it was a bit hard with younger kids to fit it around them and it was quite [good] doing a group thing where we had other people there who we knew … it made it easier to attend cause then the kids all got to hang together and things like that, so those are things for me that worked.'

' … it was free, free to participate and not only that having those marvellous fruits after classes. … most of the time I really wanted to come [to the class] and every time I come I'm looking forward to those fruits. … but you know [it's the] fruits that we don't have at home … '

Learning about health conditions, like prediabetes, was an objective of the overall project. The main reason behind peoples' decision to join the intervention was based on accessibility, and 'collective action', as a motivating factor to participate in a community-based activity.

Major theme 2: Perceived enablers of the intervention programme

Community aspects that enabled the intervention to be perceived as successful

A local hub [venue] that was familiar, central and community-centred made access easier for participants to attend. This was evident when the participants were recruited, and having knowledge of the hub made it easier for participants to attend.

'The community hall, the council hall is a good place, you know it brings everybody in and everybody feels comfortable there. You know, it's not as if it's one communitys' hall and other communities are coming into it. Whereas the council hall is a neutral space.'

' I really liked … coming together as a bigger group … and the people that are around the same ages as us so it was good connecting back with those one … it was easy going … whatever effort you put into it, that's what you get out of it and … there was no pressure with that, … because for myself its pushing myself too and not in competition with anybody … . I enjoyed the fruit and the water at the end of it. Um you know talking with the kids and having a bit of a laugh with [them], cause when we're talking about exercising and stuff like that we sometimes … can be too serious where people are just focused on the 'oh no gotta lose weight, [or] I gotta do this' and you know put too much expectation on themselves whereas this had fun factor to it … '

Group Physical Activity

The inclusion of organised physical activities by the youth and communities were reported by the participants as being easy and enjoyable. This relates to the first sub-theme, supporting the 'group-based' focus as being community-focused.

'my understanding was that it was about helping with prediabetes so, even if you are not showing any warning signs or anything you know, we're still in that target age. But there's not a lot of research about between 25–44 year olds, so yeah getting us engaged in some physical activity and all of that stuff to stop us from developing diabetes. … in the group there was people from all different kinds of parts in the community … , and there was WINZ workers, nurses, teachers, there was all different lot of people from different that work in different areas that were a part of the group.'

'What worked for me, it was to be active with my age group, catching up with people and just being able to motivate myself and motivate other people on this walk.'

Enhanced education

Dietary habits

Information cards about healthy lifestyles were given out at each intervention meeting. There was an overwhelmingly positive reaction by the participants. They reported that the short, pithy, factual information was helpful and the right amount of information to share each week. The participants reported that the cards allowed them to make better-informed decisions about types of food, nutrition, and other necessary knowledge about leading healthier lives.

'The motivation. What I said before I was very unhealthy, eating as much as I can even like going to any Tongan functions. I can't stop when I'm full that's it you know and I hardly drink water but … even though I know that's very unhealthy but I keep doing that. But that programme [education business cards] help alot. Ever since [attending the programme] I'm losing weight up to 5kgs now I'm trying to maintain that.'

'[the intervention programme] was a wake-up change for me. So, I do all those things, I … eat the vegetables, eat the fruit, you know I do all the healthy eating, but I still eat naughty … I do try to make an effort to and it did wake me up in terms [that] I need to make more of an effort, so I'm not doing enough you know, working out once a week or twice a

week is still not enough for myself and it also showed me as well that I need to spend more time with my children.'

Knowledge of healthy lifestyle

All participants agreed that the intervention had a positive impact on their overall health and wellbeing. Furthermore, the participants felt it important to share the knowledge and experiences with the wider community (family and friends). This knowledge sharing is an important action in Pasifika culture, because it is the community, family and friends that strongly endorse individual members' actions and decision-making (self-efficacy).

'What I liked [about] this intervention programme … is you get to understand the importance of healthy living. Making sure that you're committed to your diet and all the important things in life to be able to continue on with your lifestyle. You know and that's one thing that's important to me is making sure that I practice, I stay committed and also me and my wife complementing each other.'

'I want to be healthy so I want to show my kids, my children that, you know, this is the best way to go, you have to take care, I want to be a role model to the rest of my family, this is the way we need just to prevent getting diabetes because … while we have the time to be, yeah, we can do something to prevent of getting there.'

Understanding healthy lifestyle

Having a better understanding of living a **healthy lifestyle** gave participants the knowledge to make more informed decisions regarding their health.

'I like it how we … had it at the community centre because um like church people will have a barrier and its limited. Some people will come to exercise – we have to wear lavalava … , you know, Tongan traditional awareness. But when you take it to the community it's free, they wear the right the proper gears [to] exercise … '

'Probably for me some of the key messages stuck, like 30 minutes of moderate exercise a week a day ah you know ah good for your health um so some of the key messages stuck, doing exercise was stuck, doing exercises as a group was fun, um drinking water, healthy diet with fruit and that being available I think those kind of messages stuck.'

Family Involvement

The involvement of family to support the intervention participants was demonstrated through allowing **children** to be part of the intervention, this level of inclusiveness and flexibility of the programme catered to working around Pasifika families. This sub-theme directly links back to the first major theme.

'What worked for me was the time and especially doing it with my kids'

'I end up bringing my mum as well as my own children [to the intervention programme] and so to have all different age groups, you can bring anyone that's what I liked about it, you can bring anyone, don't have to worry about babysitter, make them walk it's allgood. I love that I showed my mum as well cause she does walking but she doesn't walk in a group … . And it also showed myself with my children that they just like spending time, that quality time with me and so I just love that it hit all aspects in one thing.'

Family support

The family and community acknowledged the important role of health advocacy that youth played in mobilising community activity to support healthier lives.

'My children was always talking about it. And that it to me was important if they can understand and comprehend it at a young age that will better them, you know, because that is the age where they mostly consume a lot of um, you know, things that's not good for them.'

' … to be honest, there was no expectations um because I haven't been involved in anything like this and really I was just trying to do something to support my niece, and yeah I thought I'd just see what it was all about first and just go with it.'

'I actually quite looked forward to it cause me and my wife were both in it and so it was sort of a little competition between us to see who would do the most steps so yes we kept each other on path.'

Major theme 3: Perceived Barriers of the intervention programme

Barriers

This theme highlights the most common themes identified by the participants as factors inhibiting their 'regular' involvement in the programme.

The timing of the intervention was not always convenient for all participants. Some reported other obligations took precedence over the intervention, which prevented them from attending regularly. In particular, a **late start time** of the intervention in the evening, did not always fit in with those working shift routines outside of normal work hours, this was particularly the case at the urban-based intervention site. On the contrary, the rural-based intervention site, the community provider offered alternative times for participants to complete their physical activity component and to deliver their weekly data recordings. **Childcare issues** were a recurring comment for some intervention participants, especially if there was a timetable clash with other extra-curricular activities. Although, some participants attended the intervention programme with their children, this option was not discouraged, and it was a personal choice to bring children or not.

'Yep so the barriers I suppose were my own barriers which would be shift work in my own lifestyle … I didn't make an effort to kinda do it on my own … with the work and being on your feet all the time. But it was just nice to do it with other people and talk and catch up and see and share knowledge about, you know, where their at with their health and wellbeing'

'Just the time, you know, sometimes I had other things on and it was trying to prioritise it, so you know it had to be a

priority. Transport to get there, lateness of the day … yeah those are probably the biggest barriers.'

'The target age group for this intervention was 25–44yrs old because they have the highest rate of people with prediabetes. They are also a very busy age group. Yeah this age group is quite difficult especially with um with families with kids, young kids. So for us to better target this age group maybe perhaps have some sort of activities for the kids, for them, to be able for the parents where to bring their kids to the class.'

Lack of motivation/commitment

Having a lack of motivation and commitment to come to intervention sessions was a minor barrier reported by some participants. This stemmed from having other obligations that were prioritised over the intervention, or having an injury, or in some cases, participants reported not being in positive mindset that inhibited their motivation to attend sessions.

'Sometimes it's my work, it clashes with … the time for the exercise … at 7pm, but sometimes it clashes with … things like that and with the family function, you know, yeah it happens so I can't make it to the thing [class] … then sometimes I got tired and I forgot to record it [weekly physical activity data]'.

'I think it was more of my lifestyle wasn't set up for the timing of the aerobics … , but I mean, if with a little bit more longer would be able to adjust my lifestyle to fit it in and have it set as a weekly routine, [it] would've been good.'

Major theme 4: Community-provider support

Social capital: empowerment and community capacity building

The youth and the community-facilitators provided a good model of social capital use within a community context. Participants reported their need to support the community provider and the youth carrying out the intervention programme for the purposes of social [and health] benefits.

' … it was good, cause the kids would come around and ask you [completed data for the week]. That was the best part about it. So if you forgot, someone was always there following you up anyway.'

'I need to support my kids because it's not only just one attempt but it will be maintaining the whole programme.'

' … it would be good to develop somebody in our own youth to run the training like that [exercise classes]. **Interviewer – because that's all about sustainability and getting someone in your own church to do the training …** In our own areas as well rather than having to travel … oh yeah it shouldn't be just limited to just the one community or one church group, I think it should be opened to everybody … .'

Enhanced awareness about prediabetes

The participants reported that their involvement in the intervention had increased the awareness about prediabetes in the community. Also, most participants were not knowledgeable about prediabetes and its associated risks, the community providers, facilitators, and youth provided that reservoir of knowledge for the intervention participants and their wider circle of contacts.

' … its more of the learning thing, you know what we learnt from the programme … all of the key messages that were given out every week … [there] was some stuff we didn't learn [before] … there's a few messages you don't actually learn until … we were given that information, like keeping away from high cholesterol foods and stuff like that or what sort of foods are good to eat, and what sort of times and that. … I learnt that my diet got a very big factor to play even though I might think I'm not eating a lot of sugary foods but then it turns out that you can even get diabetes from eating a lot of starchy foods and stuff, so yeah, I learnt that diet needs to change. You need to have more a balanced diet and also exercise can help reduce it [prediabetes], so that's another thing I've learnt.'

'The importance … of changing my current lifestyles. … There is a need for a change if you can't change, you know, the outcome [you] will not [be] happy with it [diabetes].'

Promoting youth advocacy

The promotion of **youth advocacy** in the community, and the role they play as catalysts for social change was widely embraced by the community. The primary involvement of the community providers was to develop the capacity of their youth members, health workers, and to try experience working with youth in this manner.

'I think it will be an opportunity for them. I know there will be good support out there with the church and the family [who] … will [be] able to help them … to empower other people because once they see it that our children can do it, of course they can do it too. And as for their leadership as well is to build up their confidence.'

> I guess it's hard when it's just an 8-week programme cause at the end of the 8 weeks it came to an end and then we're back to doing nothing again. So it needs to be just there all the time. We need to actually teach the youth to be able to run the exercise programmes cause we were relying on instructors to come and if there is no instructor then we're pretty much stuck without, you know, an exercise instructor. So, it maybe it worth actually training the youth to run exercise programmes rather than them just trying to bring in people and then they're just there. If they're actually running the programmes like doing the exercise session, running the exercise sessions, probably they'll get more involved.

The majority of participants reported feeling well supported to participate in the intervention programme by the community-provider, as well as, from their family and

friends. With this type of multi-level support, the participants' self-efficacy levels greatly enhanced their motivation to remain in the programme.

Discussion

This study presents four major thematic findings of an innovative approach to addressing the increasing rate of prediabetes in a Pasifika context, using a codesigned, youth-led approach. As an overall observation of the findings, the approach taken in the current study was initially described as a 'community-based approach', we think the 'community-centred approach' is a more accurate term to use because, the emphasis of the overall project and the intervention reflected the social-cultural elements, and the role of the community provider, 'at the centre' of the research approach. Community partners provide the important local knowledge of the community context, participants and the practicality of the research programme (Israel et al. 1998, 2005). Therefore, we will refer to this approach here onwards as 'community-centred'. This will be further discussed under major theme two.

The **first major theme (understanding the purpose of the intervention)** showed that the intervention participants were well informed by the youth and the community facilitators about the premise and purpose behind the intervention programme. The findings emphasised that Pasifika peoples' lifestyles needed to be modified, and that these behavioural changes required more often physical activity and a balanced diet, that were informed by factual knowledge. It was also clear, that prediabetes and the risk of progression to T2DM was not well known among community members, and as a result of this intervention, people were more inclined to change their behaviours as an early prevention strategy (McNamara 2017). The participants' understanding of the intervention was also evident in their expectations of the programme, and although they may not have fully understood the wider implications of the overall project, all participants were willing to trust the process, and support the efforts of the youth. This was a positive outcome as a result of a strong community-research partnership, that prioritised developing the wider community's understanding of key health issues will lead to mutual respect, and promote a positive step forward in addressing health equities (Israel et al. 1998).

Theme two (perceived enablers of the intervention) outlines four enablers that participants had reported as being key to the success of the codesigned intervention. First, the 'community-centred approach', characterised by hosting the intervention at a familiar locality that was neutral territory, free and easily accessible, were important considerations for our participants. Although some participants preferred the intervention to be held at their local church, most agreed that a neutral venue was important to separate church membership and ethnic affiliation from the intervention, and to have an open-communal approach. This was central to the programme's approach. The trained youth who had recruited friends, family and neighbours into the intervention had enabled the open-communal context, and codesigned the intervention to be culturally relevant and resourceful. This also aligned well to the definition of 'community-centred approach' given earlier. That is, characteristic of the way Pasifika peoples organises themselves and operate collectively, the weekly intervention group activities were included as part of the codesign to promote the Pasifika community mobilising together,

for a common purpose. Previous Pacific research work (Paterson et al. 2006) have been conducted in this manner, particularly for data collection purposes, and it is not new to public health research, but it is time-consuming and costly. The community collaborating actively together differentiates our study from other studies that may be more focused on a 'community-based' approach, where the intervention was simply present in the community context led by the researcher. This was not the case in the current study, as the community-research partnership co-designed and co-led the research. The second enabler, 'group physical activity', relates back to the first major theme, and to the third enabler, after having established the purpose behind the intervention, the participants learnt that physical activity alone was sufficient to reduce prediabetes risk. That is, through physical activity (i.e. achieve 10,000 steps daily and attend a weekly physical activity class), one kilogram decrease amounted to a 16% risk reduction of prediabetes (McNamara 2017). The third enabler, 'enhanced education', includes knowledge sharing and creating a better understanding of healthy lifestyles. Our findings showed that public health education through empowerment can be an active playmaker in modifying behavioural change. This is contrary to previous research (Kelly and Barker 2016), that reported education has no impact on behavioural change, particularly if the approach had been developed based on unilinear models of causation, focused on long-range predictions about behaviour change. Our study endorses the notion that information sharing partnered with empowering people to generate their own solutions to the health issues have better outcomes in producing sustained behaviour changes, as well as, having an impact on peoples' lifestyles, particularly when they are supported by the community provider. Previous Pasifika studies (Powers et al. 2015; McElfish et al. 2019) have included other behavioural self-management approaches, such as videos and other aids have been effective and culturally appropriate to delay the development of, and manage conditions like T2DM. Nonetheless, our approach has been well supported by other studies (Baird et al. 2014; Lawrence et al. 2016). The final enabler focuses on the role of 'family involvement' in an intervention programme.

Our study recognised that Pasifika peoples do have different diets and lifestyle habits, and this is largely explained by socio-economic factors, resource and material living conditions and localised deprivation (Statistics New Zealand 2006). However, the community-centred approach went beyond the individual participating in the programme, and included the whole family, as a support mechanism. This differs from other work that focuses on individual goal achievements, that has led to stigmatisation, shame, and denial, when lifestyle habits need to change (Hallgren et al. 2015). Generally, intervention research has placed less emphasis on the impact that family support can play in intervention programmes (whatever the research context). But for Pasifika peoples, extended family members can either reinforce intervention members self-efficacy in participating in the programme, or they can be the main reason for participants to drop-out. International research (Wing and Jeffery 1999; Sinclair et al. 2013), have shown the advantages that family members play in keeping participants in the intervention programme, especially if they receive indirect benefits from the intervention itself. For the current study, the inclusion of extended and younger immediate family members were not a focus of the intervention, however, as we were inherently aware of the cultural values that Pasifika peoples place on family.

Theme two's findings discussed thus far, have highlighted the usefulness of the community-centred approach that motivated individuals to continue to be an active participant. Overall, the community-centred approach theme is potentially the most important for this study. It was a true reflection of equitable community-based research, whereby the emphasis was on both conducting research with Pasifika communities, reflecting their own social-cultural realities (Hatch et al. 1993).

Additionally, the key benefits of this approach were evident in the mutually agreeable goals (i.e. improving healthier lives), focused on empowering communities to lead healthier lives through education; the collective approach of bringing together the community partners and researchers with different skills, knowledge, and expertise had enabled the quality and practicality of the research.

The **third** major theme (barriers to the intervention programme) strongly correlates with the overall second theme. Of note, this theme only included two sub-themes, although it is an entity in its own right, participants reported it often enough to warrant an independent theme. Work-life balances was the most common listed barrier preventing participants from regularly attending the intervention. This particular sub-theme carries several nuances, such as, shift-work patterns, being time poor, transportation problems, and addressing the concerns of having no childcare. Previous reports (Habour Sport 2015; Firestone, Funaki, et al. 2018) had also highlighted cultural, family, and work commitments as barriers for Pasifika peoples accessing physical activity programmes. In relation to theme two, the community-centred approach allowed for these barriers to be practically addressed. For example, one of the community sites provided a shuttle service to transport members to and from the intervention venue, and participants were also permitted to submit their weekly recorded data on a different day from the allocated intervention day.

The work-life balance is a well-known barrier for Pasifika peoples, not just in participating in healthy lifestyle programmes, but also in accessing necessary health services (Young 1997; Barwick 2000). The culturally appropriateness of the community-centred approach positively alleviates the typical reasons for work-life balance issues (e.g. financial security, cultural relevance and acceptability), as given earlier in the community examples above. Another way to address this barrier could be to install this programme as part of the community provider services (see theme four), or encourage church groups to take on this service, as part of their regular communal gatherings, with key members of the community taking on leadership roles in implementing the programme. This idea is currently being tested in a randomised control trial in the United States among Marshallese Islanders, with preliminary results reported as being very positive (Yeary et al. 2017).

The **fourth major theme**, community-provider support, demonstrated the important role that the community partners had played in the intervention. Social capital defined as the 'levels of interpersonal trust and norms of reciprocity and mutual aid, which act as resources for individuals and facilitate collective action' (Kawachi and Berkman 2014), was a strong characteristic of our overall research programme, as manifested through the 'codesign' approach of the intervention. Social capital in the current study was operating at a micro-level. It was a resource for action in introducing social structure (through the youth and community facilitators) to activating the communities (youth, facilitators and community providers) in the codesign and implementation of the intervention

programme (Coleman 1988). Central to the partnership established in this study was trust and reciprocity, which had been developed from the beginning of the research, and through the capacity-building of the community providers, facilitators and youth, which allowed local knowledge of the community, context and culture to be tailored as part of the intervention programme. Our findings differ from other studies (Hawe and Shiell 2000), because the learnings and measures taken from our study that involve community capacity building are likely to be transferable to other similar contexts (e.g. rural and urban contexts, different Pasifika ethnic groups or indigenous groups, etc). This is in part, explained by the co-design nature of the overall project, whereby community partners were involved in the planning, implementation, evaluation of the intervention, which makes this research uniquely different from the typical public health interventions. Moreover, the processes used to develop the knowledge of all the community constituents (youth, facilitator, community provider, intervention participants) in bettering their knowledge and understanding of prediabetes was clearly evident (themes one and two). Finally, the role of youth advocacy, was not only critical in advancing the health of the communities and participants, it was necessary in quashing the notion that youth do not have the capacity nor capability to be an important community-based human resource. Our study had shown the successfulness of youth advocacy, particularly in the context of close accompaniment from the facilitator and the community provider.

Limitations

The main limitation of this study can be seen in the lack of extra contextual information, that is, information from tiers two (focus groups) and three (key informant interviews) of the evaluation process. Thus, the findings have only been interpreted at a single level of evaluation. Without the added knowledge from the focus groups and key informant data, limits the triangulation of the findings presented here, and therefore our findings may only be limited to the individuals interviewed.

Conclusion

This study has conducted a process evaluation of the co-designed community-centred intervention to highlight its effectiveness and endorses the notion that interventions need to be culturally tailored to meet the needs of the community. This was indicated through several strengths of this study, as evident in the: (i) number of intervention participants ($n = 26$ out of 32) that were interviewed, who provided a breadth of knowledge about the positive and negative practicalities of the intervention; (ii) community-centred approach that highlighted 5 key enablers that demonstrated a realistic reflection of a culturally relevant approach that endorses an equitable community-research partnership. This in part, may be explained by the co-design process, the community-research partnership, and uptake and utilisation of the community's social capital; (iii) social capital (at a micro-level) should be viewed as a prominent strength of this study. However, future studies should seek better clarity and use of measures to understand how social capital can be used to influence macro-level outcomes (political influences) in improving the health system, to advance population health; (iv) overall our study strongly endorses

the role that health education and empowerment in public health interventions play, particularly when it takes on the community-centred approach; and finally (iv) developing and implementing a culturally relevant intervention programme must work differently to simple community-based approaches, it must take greater consideration of the values, beliefs, practices and the realities of the community's interests, and this may only be accomplished when trust and relationship underpins the partnership.

Ethical approval

The project received ethical approval from Health and Disability Ethics Committee (17/CEN/289), New Zealand.

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Data availability statement

To access data from this manuscript, please apply in writing directly from the Corresponding Author.

References

Baird J, Jarman M, Lawrence W, Black C, Davies J, Tinati T, Begum R, Mortimore A, Robinson S, Margetts B, et al. 2014. The effect of a behaviour change intervention on the diets and physical activity levels of women attending Sure Start Children's Centres: results from a complex public health intervention. BMJ Open. 4(7):e005290. doi:10.1136/bmjopen-2014-005290.

Barwick H. 2000. Improving access to primary care for Maori, and Pacific peoples: a literature review commissioned by the Health Funding Authority.

Bell R, Tumilty S, Kira G, Catherine S, Hale L. 2016. Using a community based participatory research model witihin an indigenous framework to establish an exploratory platform of investigation into obesity. Obesity Medicine. 2:19–24.

Braun V., Clarke V. 2006. Using thematic analysis in psychology. Qualitative Research in Psychology. 3(2):77–101.

Coleman JS. 1988. Social capital in the creation of human capital. American Journal of Sociology. 94: S95–S120.

Coppell K, Man JI, Williams SM, et al. 2013. Prevalence of diagnosed and undiagnosed diabetes and prediabetes in New Zealand: findings from the 2008/09 Adult Nutrition Survey. New Zealand Medical Journal. 126(1370):23–42.
Coppell KJ, Tipene-Leach DC, Pahau HLR, Williams SM, Abel S, Iles M, Hindmarsh JH, Mann JI. 2009. Two-year results from a community-wide diabetes prevention intervention in a high risk indigenous community: the Ngati and Healthy project. Diabetes Research and Clinical Practice. 85(2):220–227. doi:10.1016/j.diabres.2009.05.009.
Counties Manukau District Health Board. 2010. LotuMoui Health Programme.
Diabetes Prevention Program Research Group. 2002. Reduction in the incidence of type 2 diabetes with lifestyle intervention or metformin. N Engl J Med. 346(6):393–403.
Diabetes Prevention Program Research Group. 2009. 10-year follow-up of diabetes incidence and weight loss in the diabetes prevention program outcomes study. Lancet. 374(9702):1677–1686.
Durie M. 2003. Nga Kahui Pou: Launching Maori Futures. Wellington: Huia Publishers; p. 183–197.
Eyles H, Jull A, Dobson R, Firestone R, Whittaker R, Te Morenga L, Goodwin D, Mhurchu CN. 2016. Co-design of mHealth delivered interventions: a systematic review to assess key methods and processes. Current Nutrition Reports. 1–8. doi:10.1007/s13668-016-0165-7.
Firestone R., Faeamani F., Okiakama E., Funaki T., Henry A., Prapavessis D., Masaga J., Firestone J., Tiatia-Seath J., Matheson A., et al. 2021. Pasifika prediabetes youth empowerment programme: learnings from a youth-led community-based intervention study. New Zealand Medical Journal.
Firestone R, Funaki T, Dalhousie S, Henry A, Vano M, Grey J, Jull A, Whittaker R, Te Morenga L, Ni Mhurchu C. 2018. Identifying and overcoming barriers to healthier lives. Pacific Health Dialog. 21(2):54–66.
Firestone R, Matherson A, Prapavessis D, Hamara M, Kaholokula K, Tuisano H, Tevita G, Henderson J, Schlser M, Ellison-Loshmann L. 2018. Pasifika youth empowerment programme: a potential public health approach in tackling obesity-health related issues. AlterNative: An International Journal of Indigenous Peoples. 14(1):63–72.
Habour Sport. 2015. Choose change for a healthier me.
Hallgren EA, McElfish PA, Rubon-Chutaro J. 2015. Barriers and opportunities: a community-based participatory research study of health beliefs related to diabetes in a US Marshallese community. The Diabetes Educator. 41(1):86–94. doi:10.1177/0145721714559131.
Harwood M, Tane T, Broome L, Carswell P, Selak V, Reid J, Light P, Stewart T. 2018. Mana Tu: a whanau ora approach to type 2 diabetes. NZ Med J. 131(1485):76–83.
Hatch J, Moss N, Saran A, Presley-Cantrell L, Mallory C. 1993. Community research: partnership in Black communities. American Journal of Preventive Medicine. 9(6):27–31. doi:10.1016/S0749-3797(18)30662-7.
Hawe P, Shiell A. 2000. Social capital and health promotion: a review. Social Science & Medicine. 51:871–885.
The Human Nutrition Unit. 2014. PREVIEW NZ. University of Auckland. [accessed 2016 Jul 5].
Israel BA, Parker EA, Rowe Z, Salvatore A, Minkler M, López J, Butz A, Mosley A, Coates L, Lambert G, et al. 2005. Community-based participatory research: lessons learned from the centers for children's environmental health and disease prevention research. Environ Health Perspect. 113:1463–1471. doi:10.1289/ehp.7675.
Israel BA, Schulz AJ, Parker EA, Becker AB. 1998. Review of community-based research: assessing partnership approaches to improve public health. Annu Rev Public Health. 19:173–202.
Kawachi I, Berkman L. 2014. Social cohesion, social capital and health. In: Kawachi I., Berkman LF, Glymour MM, editors. Social epidemiology. Oxford University Press; p. 174–190.
Kelly MP, Barker M. 2016. Why is changing health-related behaviour so difficult? Public Health. 136:109–116. doi:10.1016/j.puhe.2016.03.030.
Kohlstadt IC, Anderson Steeves ET, Rice K, Gittelsohn J, Summerfield LM, Gadhoke P. 2015. Youth peers put the "invent" into NutriBee's online intervention. Nutrition Journal. 14:2–8.
Lawrence W, Black C, Tinati T, Cradock S, Begum R, Jarman M, Pease A, Margetts B, Davies J, Inskip H, et al. 2016. 'Making every contact count': evaluation of the impact of an intervention

to train health and social care practitioners in skills to support health behaviour change. Journal of Health Psychology. 21(2):138–151. doi:10.1177/1359105314523304.
McElfish PA, Rowland B, Riklon S, Aitaoto N, Sinclair KiA, Ima S, Kadlubar SA, Goulden PA, Hudson JS, Mamis S, Long CR. 2019. Development and evaluation of a blood glucose monitoring YouTube video for Marshallese patients using a community-based participatory research approach. Policy, Politics, & Nursing Practice. 20(4):205–215. doi:10.1177/1527154419872834.
McNamara C. 2017. Tacle prediabetes: a practical self-management guide to controlling prediabetes. Auckland: ANELCA Ltd.
Ministry of Health. 2011. Whanau Ora: Transforming our futures.
Ministry of Health. 2016a. Healthy Families New Zealand. [accessed 2016 June 28].
Ministry of Health. 2016b. Improving the health of New Zealanders. [accessed 2016 June 28].
Ministry of Health. 2016c. Tagata Pasifika in New Zealand. [accessed 2016 June 28].
Paterson J, Tukuitonga CR, Abbott M, et al. 2006. Pacific Islands families first two years of life study: design and methodology. NZ Med J. 119:U1814.
Powers MA, Bardsley J, Cypress M, Duker P, Funnell MM, Fischl AH, Maryniuk MD, Siminerio L, Vivian E. 2015. Diabetes self-management education and support in type 2 diabetes: a joint position statement of the American Diabetes Association, the American Association of Diabetes Educators, and the Academy of Nutrition and Dietetics. Diabetes Care. Diabetes Care. 38 (7):1372–1382. doi:10.1177/0145721716689694.
Prescott SM. 2008. Using Talanoa in Pacific business research in New Zealand: experiences with Tongan entrepreneurs. AlterNative: An International Journal of Indigenous Peoples. 4(1):127–148. doi:10.1177/117718010800400111.
Pulotu-Endemann K. 2001. Fonofale Model of Health.
Robson B, Harris R. 2007. Hauora: Maori standards of health IV. A study of the years 2000–2005.
Sinclair KA, Thompson C, Makahi EK, Shea-Solatorio C, Yoshimura SR, Townsend CKM, Kaholokula JK. 2013. Outcomes from a diabetes self-management intervention for native Hawaiians and Pacific people: partners in care. Annals of Behavioral Medicine: a Publication of the Society of Behavioral Medicine. 45(1):24–32. doi:10.1007/s12160-012-9422-1.
Statistics New Zealand. 2006. Pacific Mobility in NZ. Statistics NZ.
Swinburn B, Sacks G, Vandevijvere S, et al. 2013. INFORMAS (International Network for Food and Obesity/non-communicable diseases Research, Monitoring and Action Support): overview and key principles. Obes Rev. 14:1–12. doi:10.1111/obr.12087.
Te Morenga L, Pekepo C, Corrigan C, Matoe L, Mules R, Goodwin D, Dymus J, Tunks M, Grey J, Humphrey G, et al. 2018. Co-designing an mHealth tool in the New Zealand Māori community with a "Kaupapa Māori" approach. AlterNative: An International Journal of Indigenous Peoples. 14(1):90–99. doi:10.1177/1177180117753169.
Tipene-Leach DC, Coppell K, Abel S, Pāhau HLR, Ehau T, Mann JI. 2013. Ngāti and healthy: translating diabetes prevention evidence into community action. Ethnicity & Health. 18 (4):402–414.
Voaioleti T. 2006. Talanoa research methodology: a developing position on pacific research. Waikato Journal of Education. 12:21–34.
Wing RR, Jeffery RW. 1999. Benefits of recruiting participants with friends and increasing social support for weight loss and maintenance. American Psychological Association. doi:10.1037/0022-006X.67.1.132.
Wood A, Johnson M. 2016. Green prescription Active Families Survey Report.
Yeary KH, Aitaoto N, Sparks K, Ritok-Lakien M, Hudson JS, Goulden P, Bing W, Riklon S, Rubon-Chutaro J, McElfish PA. 2017. Cultural adaptation of diabetes self-management education for Marshallese residing in the United States: lessons learned in curriculum development. Progress in Community Health Partnerships: Research, Education, and Action. 11(3):253–261. doi:10.1353/cpr.2017.0030.
Young N. 1997. Pacificans' access to primary health care in New Zealand: a review. Pacific Health Dialogue. 4(2):68–75.