

## RESEARCH ARTICLE

# Acceptability, feasibility and preliminary impact evaluation of a pilot text-message study on improving the health of Aboriginal people with, or at risk of, chronic disease in Australia

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## Abstract

**Issue addressed:** Aboriginal people experience higher rates of chronic disease than other Australians, largely due to modifiable risk factors. This study aimed to evaluate the acceptability, feasibility and preliminary impact of a pilot text-message program on improving the health of Aboriginal people with, or at risk of, chronic disease.

**Methods:** A before and after study using a convenience sample of Aboriginal Australian adults determined the impact of a 6-month healthy lifestyle text-message intervention on lifestyle behavioural measures including nutrition, physical activity and smoking. Process evaluation of participants and program facilitators determined program acceptability and feasibility.

**Results:** Twenty Aboriginal people enrolled in the study, with high study completion and program acceptability. The two program facilitators reported the low-cost automated text-message program to be highly acceptable, feasible to deliver and led to environmental program changes. Preliminary impact data showed significant improvements in vegetable consumption at 3 and 6 months, but not for other health outcome measures.

**Conclusions:** The text-message program was highly acceptable and feasible to deliver, and has potential as an adjunct to usual care. Further research is required to determine program efficacy with a larger sample size.

**So what?:** Text-messages to improve the health of Aboriginal people are highly acceptable, feasible to deliver and can complement existing community-led group programs. Further testing of this low-cost program is warranted to determine program efficacy.

## KEYWORDS

Aboriginal, chronic disease, diabetes, healthy lifestyle, nutrition, self-management, text-message

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## 1 | INTRODUCTION

Aboriginal and Torres Strait Islander people experience a burden of disease 2.3 times higher than the rest of the Australian population.<sup>1</sup> Over two-thirds of the gap in disease burden is attributed to non-communicable disease and its antecedent risk factors.<sup>1</sup> To better support communities to improve health outcomes and reduce this gap, additional types of care are required.

Text-message interventions have shown promising results for improving chronic diseases, health and behaviour change,<sup>2</sup> and health promotion initiatives.<sup>3</sup> They are low cost and demonstrate high reach,<sup>4</sup> and mobile phone use is reportedly high among Aboriginal people.<sup>5</sup> Despite this, limited evidence exists on text-message interventions for Aboriginal people.

This pilot study aims to:

1. Test the acceptability and feasibility of a healthy lifestyle text-message support program for Aboriginal people with, or at risk of, chronic disease attending a group-based community-led Aboriginal health program
2. Assess the preliminary impact of the text-message program on lifestyle behaviours.

## 2 | METHODS

### 2.1 | Study design

A before and after study design using a convenience sample of Aboriginal people was used to assess the impact of a 6-month text-message intervention. The three local Aboriginal Community Controlled Health Services consented for the study to occur in their region. The study was guided by ethical values and principles of research with Aboriginal and Torres Strait Islander people,<sup>6,7</sup> and was approved by the Aboriginal Health and Medical Research Council of New South Wales Ethics Committee (1274/17).

### 2.2 | Eligibility and recruitment

Participants were eligible if they identified as Aboriginal or Torres Strait Islander; had or were at risk of a chronic disease; were aged 18+ years; attended the Illawarra Aunty Jean's Chronic Care Program or the Illawarra Koori Men's Support Group; had access to a mobile phone; provided informed consent and received medical clearance. Recruitment occurred through face-to-face meetings at the Aunty Jean's Program and the Koori Men's Support Group, which are urban setting-based programs. Participants are referred to as Aboriginal in this paper as no participants identified as Torres Strait Islander.

### 2.3 | The intervention

Text-messages were adapted from the DTEXT program, a 6-month text-message intervention aimed at improving the health of Australian adults with type 2 diabetes.<sup>8</sup> To ensure cultural acceptability, text-

messages from the DTEXT program were reviewed by the Aunty Jean's Program facilitator to ensure cultural suitability. Facilitators from the Aunty Jean's Program and the Koori Men's Support Group received the text-messages in conjunction with their program participants to allow for discussion during group sessions.

Text-message topics included nutrition, physical activity, sedentary behaviour, weight, chronic disease self-management, medication adherence and smoking cessation (Table 1). Each message was up to 160 characters, cost 12 cents to deliver and had appropriate readability.<sup>9</sup> Messages were written in English language using plain text, and automatically sent between 9 AM and 3 PM, with a frequency of daily for months 1–3, and four times per week for months 4–6. No message was sent twice. Participants could withdraw from the study by texting STOP.

## 2.4 | Outcome measures

### 2.4.1 | Process evaluation

Process data on the intervention acceptability was obtained from questionnaires at 3 and 6 months. Participant retention was recorded. Semi-structured in-depth face-to-face interviews with the facilitators from Aunty Jean's Program and the Koori Men's Support Group determined their opinions on program acceptability and feasibility.

### 2.4.2 | Impact evaluation

A face-to-face or telephone questionnaire was undertaken with participants at baseline, 3 and 6 months, to assess self-reported lifestyle behaviours (eg nutrition, physical activity and smoking status).

## 2.5 | Data analysis

Data analysis was conducted using SPSS v25. Change scores and standard deviations for the difference in means of complete cases were used to describe changes from baseline to 3 months and baseline to 6 months for self-reported lifestyle behaviours. A chi-squared test assessed smoking status.

Qualitative content analysis from semi-structured interviews with participants and program facilitators included data immersion and categorisation of common themes to identify acceptability measures, key enablers and barriers for program feasibility and recommendations for future implementation.

## 3 | RESULTS

### 3.1 | Baseline characteristics

Twenty participants enrolled in the study, aged 22–83 years (median 63.0 years). The majority of participants were pre-obese (31.2%) or

**TABLE 1** Examples of text-messages

Theme	Number and percentage of messages sent for each theme, n (%)	Example text-messages (max characters 160 per message)
Healthy eating	41 (27)	Try keeping some frozen vegetables in your freezer. They're easily added to pasta & stir fry or can be served with canned fish as a quick healthy meal. Karen
Physical activity	41 (27)	It's easier to be physically active if you are well planned. Try getting your exercise gear ready tonight so it's easy to grab for tomorrow's session. Karen
Reducing sedentary behaviour	5 (3)	Try to be active in as many ways as you can today, for example, stand instead of sitting when on phone, walk to the shops, take the stairs, park your car further away.
Healthy weight	15 (10)	Sugary drinks (soft drink, sports drink, cordial) can lead to weight gain – a 600 ml soft drink bottle has 16 teaspoons of sugar! Choose water for better health.
Chronic disease self-management	30 (20)	A doctor's care plan gives you 5 subsidised allied health visits each year (eg, podiatry, exercise physiology and dietitian). Ask your doctor to write you one.
Medication adherence	9 (6)	To make sure your medications are still the best option for you, have them reviewed at least once per year. Ask your doctor for a review at your next visit.
Smoking cessation	9 (6)	Hi (name), if you know someone who needs help quitting smoking call the Aboriginal Quitline on 137 848. Quitline staff are trained to help. Karen

obese (56.3%), with a mean BMI of 31.9 kg/m<sup>2</sup>. Those meeting healthy lifestyle guidelines for vegetable (5%) and fruit (30%) consumption were low. Half of the participants met physical activity guidelines, and 40% were smokers.

### 3.2 | Process evaluation

#### 3.2.1 | Participants

There was high program completion (18/20, 90%). All participants reported the text-messages were beneficial, helped to improve their health and provided information at the right level (18/18, 100%). The majority (14/18, 78%) thought the text-messages helped with behaviour change, and the text-message frequency was about right (13/18, 71%). Half of the participants reported the duration of the text-message program was the right length, while 44% (8/18) reported 6 months to be too short, with a preference (7/8, 88%) for 12 months or longer.

Participants reported the messages to be encouraging, motivational and made them feel like someone cared about them. The messages were reported as useful and provided easy to achieve strategies, and could be kept to read again and be shared with others:

'I like the little tips and hints, they are easy to do. They have good ideas of things to try, things I haven't heard about, or that I knew about but had forgotten'.

'I save them all and share them with others. I talk about them with other people in the program'.

'They really helped me change. Easy to read and understand. I read them all the time'.

#### 3.2.2 | Facilitators

Both program facilitators reported participants liked the text-message program. One facilitator reported the program was the right duration and frequency, but the other facilitator suggested it should be longer than 6 months and be daily messages throughout. Both facilitators requested the text-message program to become available as a standard part of their programs. Locally controlled program delivery was considered favourable over centralised delivery at a state-wide level, or by non-Aboriginal organisations.

Environmental changes were reported as a result of the text-messages, such as participants requesting a more nutritious program lunch menu with wholegrain bread and water replacing white bread and fruit juice. Increased engagement and participation in group sessions were also reported:

'We had to get speakers into the group as people wanted to know more, and had questions they wanted to ask... from the information in the messages'.

One facilitator reported the text-messages were being shared by participants externally.

'People can re-read them and think about what it means. They are sharing the messages with other people, both in the group and out of the group, and teaching those who didn't get the messages about the information they have learnt'.

Text messages could be saved on mobile phones and read again which was reported as beneficial, especially for younger Aboriginal men:

'The young fellas are always on their phones so the messages are good coming through on them as text-messages. It makes them slow down and stop and think about the information'.

Overall the program facilitators reported feeling surprised at how well received the text-message program was:

'I thought they would just be little messages, I didn't realise the reaction would be like this. The program is a great educational tool'.

### 3.3 | Impact evaluation

Vegetable serves per day significantly increased at both 3 and 6 months. No other self-report lifestyle behaviours showed significant outcomes; however, a positive trend for improvement was seen for consumption of fruit, sugary drinks, reduced alcohol and increased

physical activity (Table 2) and smoking rates reduced by around half at 3 (4/18, 22%) and 6 months (3/18, 17%).

## 4 | DISCUSSION

This is one of the first Australian studies to examine the acceptability, feasibility and preliminary impact of a healthy lifestyle text-message intervention delivered within existing community-led Aboriginal health group programs. The intervention was well accepted by participants and program facilitators, feasible to deliver, and led to positive environmental group changes. The intervention significantly improved vegetable intake, but not other health behaviours.

High rates of program acceptability and engagement may have resulted from the intervention using cultural determinants of health,<sup>10</sup> with program delivery occurring within an established Aboriginal-led program to enhance participant empowerment, self-determination, connectivity and cultural safety.<sup>11</sup> Offering all clients the text-messages may have enhanced program acceptability, as positive outcomes are reported with inclusive interventions<sup>11</sup> which are preferred over randomised control trials.<sup>12</sup> Our minimally tailored text-messages were considered culturally acceptable, similar to findings from an Aboriginal infant feeding mHealth program with minimal tailoring.<sup>13</sup> Despite the text-messages being automated, they were perceived as personal and caring by participants; and the ability to save, re-read and share text-messages was valued; also reported in another Aboriginal study involving a text-message component.<sup>11</sup>

The low-cost, automated text-message program was reported as feasible by both program facilitators, with requests for the program to become embedded into standard practice and suggestions to offer it to other community-led Aboriginal organisations. High use of mobile phones among Aboriginal people,<sup>5</sup> and the fact that text-messages

**TABLE 2** Self-report behavioural measures at baseline to 3 months and baseline to 6 months for complete cases

Outcome measure	n	Time	Mean (SD)	Difference (SD)
Vegetable, serves per day	17	Baseline	2.08 (1.41)	
		3 months	2.94 (1.80)	0.86 (1.55) <sup>a</sup>
		6 months	3.35 (2.21)	1.27 (2.14) <sup>a</sup>
Fruit, serves per day	17	Baseline	1.19 (1.05)	
		3 months	1.43 (1.18)	0.24 (1.33)
		6 months	1.40 (1.24)	0.21 (0.95)
Sugary drinks, cups per week	17	Baseline	2.12 (3.54)	
		3 months	1.81 (3.53)	-0.31 (1.84)
		6 months	1.82 (3.34)	-0.30 (2.51)
Alcohol, standard drinks per week	16	Baseline	3.68 (6.75)	
		3 months	2.55 (4.82)	-1.13 (6.61)
		6 months	2.56 (4.48)	-1.13 (3.55)
Total PA, sessions per week	17	Baseline	2.82 (2.04)	
		3 months	3.29 (2.02)	0.35 (1.33)
		6 months	3.18 (1.85)	0.24 (2.11)

<sup>a</sup>Significant outcome; PA: physical activity.

can be received without phone credit or data, provide significant potential for access to health support.<sup>14</sup> The ease and convenience of text-messages may also be preferred over health apps for Aboriginal people who have reported computer literacy issues<sup>11</sup> and poor engagement.<sup>12</sup> The sharing of text-messages by participants with their community demonstrated program reach outside of the study group.

Our pilot study's findings of improved vegetable consumption, as found in the DTEXT study,<sup>8</sup> is an important outcome as poor nutrition is a modifiable risk factor for disease burden in Aboriginal people.<sup>1</sup> It is possible that vegetable consumption had the greatest propensity to change as it was very low in our study. The other lifestyle factors of fruit, sugary drinks, alcohol, physical activity and smoking showed potentially promising results, and warrant further investigation with a larger study to determine efficacy. This would add to the limited literature regarding health text-message programs for Aboriginal people, such as the Too Deadly for Diabetes study which reported significant improvements in HbA1c, systolic blood pressure and weight loss at 10 weeks after an intensive multi-factorial intervention including meal plans and an online cooking program; tracking of weight loss, foods eaten and exercise into personalised diary; flexible exercise program; YouTube videos on motivation, barriers and exercise sessions; text-messages; and face-to-face weekly group sessions.<sup>11</sup>

The strengths of our study include the involvement of the Aunty Jean's Program facilitator in the text-message program design and the adaptation of text messages that had previously been used in the DTEXT program.<sup>8</sup> The intervention design and delivery supported cultural determinants of health<sup>10</sup> and the pragmatic implementation allowed for real-world setting evaluation. Study limitations include a lack of control group meaning external factors such as messages through social media, television or radio that could have influenced outcomes was not accounted for, the small sample size and short study duration.

Future research would help to determine the preferred program duration and text-message frequency, and a larger sample size, collection of clinical data, and longer follow-up period would determine program efficacy.

## 5 | CONCLUSION

This pilot study showed that a healthy lifestyle text-message intervention for Aboriginal people with, or at risk of chronic disease, was feasible, acceptable and improved vegetable intake. The text-messages empowered participants, increased group engagement and led to environmental changes at the request of participants. The text-message program has the potential to be an adjunct to usual care. Further research is required to determine program efficacy.

### AUTHOR CONTRIBUTIONS

Karen Waller, Susan Furber and Adrian Bauman contributed to the study design and conceptualisation. Karen Waller and Susan Furber implemented the methodology. Karen Waller completed the data analysis, prepared the draft manuscript and is accountable for all

aspects of the work. All authors critically reviewed the manuscript and had final approval of the submitted version.

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### CONFLICT OF INTEREST

The authors declare no conflict of interest.

### DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

### ETHICS STATEMENT

The study was approved by the Aboriginal Health and Medical Research Council of New South Wales Ethics Committee (1274/17, 4th September 2017).

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