



Using telehealth with Aboriginal and Torres Strait Islander people in rural communities

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Abstract

Aim: This project reports on the evaluation of the *Staying Strong* project, which aimed to enable older Aboriginal and Torres Strait Islander people to better manage chronic health conditions by using telehealth equipment to self-monitor vital health signs, primarily in their own homes. The project was located in two sites in NSW and two in Qld.

Methods: Base-line and end-of-evaluation surveys were conducted, along with a series of Yarning Circles and one-on-one interviews with participants, staff and other stakeholders. Readings from the telehealth equipment were recorded in a Central Data Monitoring Centre. Quantitative data were analysed using SPSS 20; qualitative data were transcribed and read by two of the research team to identify recurring themes.

Results: There were 70 'valid' Baseline surveys and 54 follow-up surveys completed by participants. Demographic characteristics included mean age (62 years), gender (52 females; 18 males) and marital status (22 married; 17 widowed or divorced; 19 single). The majority of participants had five or more chronic health conditions; the most common were diabetes mellitus, hypertension or hypotension. Attitude to Technology was positive at both survey times and Social Connectedness scores were high. Compliance was generally high. There were 570 of 27,752 "outside of set parameters" readings, of which 330 were 'high' (red) alerts. Participants demonstrated increased awareness and improved understanding of their health conditions and what impacts those. Barriers and enablers to telehealth were identified.

Conclusions: Participants demonstrated a high level of engagement with the technology but some equipment needs to be more user-friendly. Reliable and fast Internet connection is critical for telehealth monitoring. Systematic review of monitoring plans could reduce the number of missed readings. Better outcomes result when general practitioners (GPs) and registered nurses (RNs) work together.

Introduction

New and innovative health care solutions are required to respond to increasing health services demand that is due to increases in the number of older people in the population, their growing expectations for health care and decreasing availability of both informal carers and the aged care workforce¹. With government policies promoting more care being provided in the community² and the Living Longer, Living Better Aged Care Reforms² promoting flexible care and support in people's homes, there is a need for older people to have access to services that enable them to do so safely. Access to health services in rural and regional areas is problematic for many older Australians and especially Aboriginal and Torres Strait Islander (ATSI) older people, due to both remoteness and social marginalisation. In addition, the health of Indigenous people in Australia is poorer overall than the health of non-Indigenous people³, with chronic health conditions, including diabetes, high blood pressure and heart and renal disease, particularly prevalent⁴.

These issues call for new and innovative health service provision solutions. One potential solution is the use of telehealth and telecare. Telehealth services use information and communications technologies to deliver health services and transmit health information over both long and short distances and can be used for diagnosis, treatment, preventive and curative healthcare.

In 2009, Baptist Community Services described telehealth as a service where clients' vital signs are monitored remotely, at pre-set time intervals, using technology in their home. Readings are reviewed by a trained telehealth consultant and if they fall outside the parameters set by the principal healthcare provider, a clinical process map is followed⁵.

Internationally, use of telehealth has been increasing, primarily through government-funded projects^{6,7,8,9}, with some promising results^{8,9} including reduced use of hospital emergency services⁹, although few have investigated safety issues.

An Australian home telehealth study which did investigate the safety aspect of home telehealth reading failure rates found that contributing factors included equipment failure, lack of staff follow-up of missed reading, user error, and participant noncompliance¹⁰. Participant acceptance and compliance are critical factors in telehealth evaluation^{11,12,13}.

This paper reports the independent evaluation of one of the Telehealth Pilot Projects funded by the Australian Government as part of the 2011 National Digital Economy Strategy. The *Staying Strong* project, implemented by integratedliving Australia Ltd aimed to enable older Aboriginal and Torres Strait Islander people to better manage chronic health conditions by using telehealth self-monitoring equipment, primarily in their own homes.

Methods

Following a full NEAF application, ethics approval was obtained, under NHMRC research Guidelines, from the RACGP Research Ethics Committee. An Advisory Committee of relevant, highly-experienced health and other professionals, including a Senior Aboriginal Medical Service Executive, was established and meetings were held with relevant stakeholders, including senior staff of Aboriginal Medical Services and the Director of Aboriginal Health at one of the Medicare Local services in one of the project sites.

The project was located in two sites in rural/regional NSW and two in Qld. Participants were supplied with a tablet device and a range of blue tooth peripheral devices depending on their health conditions. The participant's GP or project Registered Nurses (RNs), in consultation with the project participant, established what conditions would be monitored, frequency of monitoring and acceptable parameters for each reading. The most common conditions monitored were diabetes (blood glucose levels) and blood pressure (both high and low). Project RNs in each location trained participants to use the equipment and remotely triaged their vital sign readings.

Data collection: RNs at each site were trained in the evaluation data collection methods, including the consent process and survey administration. Base-line and Follow-up (end-of-evaluation) surveys, which included the Personal Wellbeing Index (validated to measure quality of life in eight domains, including across cultural groups), the Attitude to Technology and brief Social Connectedness Scales (also validated) were conducted. Readings from the telehealth equipment were recorded in a Central Data Monitoring Centre. At the conclusion of the evaluation period, four Yarning Circles were held with participants and 14 one-on-one interviews were undertaken with participants, staff and other stakeholders. With permission of all Yarning Circle and interview participants, these sessions were recorded for later verbatim transcription and analysis. Quantitative data were analysed using SPSS 20; qualitative data transcripts were read by two of the research team, using grounded theory (Glaser and Strauss) to identify recurring themes.

Results

From 120 participants enrolled in the study by 30 May 2014, 70 met the selection criteria for participation in the study (equipment connected and first reading done by 7 February 2014 to allow at least eight weeks of data collection in the evaluation period, participant had capacity and consent to participation obtained).

Survey completion: 70 Baseline and 54 Follow-up surveys were completed by participants across the 4 sites; 3 participants withdrew from the project during the evaluation period and 13 declined to complete the follow-up survey. Demographic characteristics included mean age (62), gender (52 females, 18 males), and marital status (22 married; 17 widowed or divorced, 19 single, 12 "other"). The majority of participants had five or more chronic health conditions; the most common were diabetes and high or low blood pressure. The Barthel Index was used to assess functional independence at Baseline; 69 percent of respondents scored a maximum of 20/20, with only 3 percent scoring <15/20.

Personal Well-Being Index (PWI): At Baseline, the overall PWI score was 74.4 points, which is within the Australian normative range of 73.4 to 78.4 points. By follow-up this had increased overall to 75.7, but this increase was not significant. The scores for six of the eight quality of living domains increased between Baseline and Follow-up; although none reached significance, changes in scores for the Health and Future Security domains approached significance (Table 1).

Table 1 Changes in Personal Wellbeing Index Values between Baseline and Follow-up; % (n)

Domain	PWI Baseline mean (SD)	PWI Follow-up mean (SD)	p for significance
Standard of living	78 (23)	79 (22)	0.52
Health*	57 (26)	63 (21)	0.07
Achieving in life	71 (28)	76 (22)	0.18
Relationships	84 (22)	79 (21)	0.32
Safety	77 (25)	79 (25)	0.10
Community connectedness	81 (23)	82 (21)	0.95
Future security*	68 (26)	72 (23)	0.07
Spirituality/religion	80 (22)	77 (25)	0.75
TOTAL	74.4 (17.9)	75.7 (16.6)	0.21

*Approached significance

Attitude to Technology was positive at both survey times and Social Connectedness scores were also high at Baseline and remained so at Follow-up.

Hospital Admissions: At Baseline, participants reported the number of hospital admissions they had experienced in the 12 months prior to the study commencement; at Follow-Up they reported number of hospital admissions during the study period. Overall, the number of admissions reported for the Follow-up period was lower than the number reported for the 12 months prior to study commencement. At the time of completing the Baseline questionnaire, 30% (n=21) of participants had been admitted to hospital in the previous 12 months. From the time between completing the Baseline questionnaire to completing the Follow-up survey, 13% (n=7) of all participants were admitted to hospital. Of these, 4% (n=2) reported that the problem leading to their hospitalisation was identified directly from the telehealth readings. However, this result must be treated with caution as the follow-up time periods over which the number of hospital admissions were reported varied between participants (depending on when they joined the project), the Baseline and Follow-up hospital admission rates are not directly comparable.

Equipment Readings: The most frequently recorded biomedical measures were heart rate (6,248 readings), systolic blood pressure* (3,671 readings) and diastolic blood pressure* (3,659 readings). Oxygen saturation (2,596 readings), blood glucose (2,494 readings), body weight (2,509 readings), temperature (649 readings), forced expiratory volume (1 second) (241 readings) and forced vital capacity (231 readings) were less frequently recorded (Table 2)

*Differences in systolic and diastolic BP numbers are correct; diastolic BP commonly does not record (particularly in patients with low diastolic BP) because it is possible to follow Korotkoff V (the marker of DPB) all the way to 0 in some patients, and the equipment cannot detect very low diastolic BP.

Table 2: Biomedical Readings over the Course of the Project

	Mean	Minimum	Maximum
Heart rate (bpm)	80	36	165
Systolic blood pressure (mmHg)	126	48	230
Diastolic blood pressure (mmHg)	79	35	159
Blood glucose (mmol/L)	8.7	1.6	30.1
Oxygen saturation (%)	93.9	56**	100

**There were 30 x 56% readings and 34 x 57%. Although these are low readings, we are confident they are accurate.

Comparison of the two sites with the highest numbers of participants found that compliance with recommended frequency of readings was generally good overall. For Site 1, there was no difference between usage and compliance; for Site 2, usage was higher than compliance, indicating that some participants took their readings more frequently than they were required to. In addition, there was much higher usage and compliance at Site 1 than Site 2 (Tables 3 and 4). These differences are discussed below.

Table 3 BGL & BP Average Usage, Sites 1 & 2

	Site 1 (N=25)	Site 2 (N=33)
Blood Glucose Levels	31% (n=15)	84% (n=17)
Blood Pressure	22% (n= 9)	95% (n=29)

Table 4: BGL & BP Average Compliance, Sites 1 & 2

	Site 1 (N=25)	Site 2 (N=33)
Blood Glucose Levels	31% (n=15)	72% (n=17)
Blood Pressure	22% (n= 9)	70% (n=29)

For the 54 participants across the 4 sites who completed both Baseline and Follow-up surveys, there was a total of 27,752 valid readings, of which 570 were outside the parameters set by the participant's GP or project RN; of the 570, 330 were 'high' (red) alerts (mostly relating to heart rate and body weight). RNs used their knowledge of participants to triage responses to the alerts.

Qualitative Data: In the Yarning Circles and interviews, participants were asked what had motivated them to take part in the project; responses included: being told about the project in a 'safe' environment, e.g., when they went for their regular Elders' Health Check or when they attended the Aboriginal Day Care Centre or the clinic at the AMS; encouragement from their GP to join the project; or being told about it by family members or friends who were already participating.

Factors that contributed to participants continuing in the project included being able to keep watch over their own health status without needing to go the GP or clinic, which was seen as a very positive thing by those who were busy as carers and/or working, as well as by those for whom transport was an ongoing issue:

Sometimes they don't have a car and they can't drive to the doctor, because someone has to organise transport. This way they have someone checking on them without them having to leave their own home (Staff Member 4).

The main barrier to involvement and compliance was time. Many participants have very busy lives, including doing paid work, volunteering and caring for family members; making time to do their readings at the agreed time can be challenging and is not always a high priority:

Some of the older women, while they have poor health, their priority is the health and wellbeing of others. Some of them are carers, of their husbands/partners/grandchildren and others (Staff Member 1).

One participant has a sick husband and cares for two grandchildren and her sister, and also goes out to work. Often she was too busy to do her readings:

From the time I get up in the morning I've either got a phone call or someone's calling me out to help do something or I've got a crisis somewhere along the line (Participant 2).

Another participant cares for two great-grandchildren, one with special needs and a 17-month-old infant, and also goes to work two days a week. She had to schedule her readings for two days a week in the afternoon:

Yeah, because I'm calm, because (her grandson with special needs) is at school and the baby is at day care, I can relax and get a better reading (Participant 4).

As noted above, compliance with monitoring was more of an issue in some sites than others. In some locations, where the participants' GPs set the parameters for the peripherals, compliance was higher; in locations where the RN set the parameters (because of the difficulty in getting GP involvement) it was not as high, possibly because GP involvement may have given the project more 'legitimacy' in the eyes of participants. There were also site-specific demographic differences among participants, such as education and employment/income levels, with better compliance in the higher socio-economic groups (although many participants in these groups still had significant health problems, including uncontrolled diabetes).

Some Yarning Circle participants said that they had not had their Blood Glucose levels checked for many years before joining the project but now do it every day. Some of these people also keep a daily written record of their results to take to their GP. For one participant, this is assisting him to regain his Heavy-Combination driver's licence. The readings have prompted him to give up sugar, so that he can get his diabetes under control and regain his licence.

Main enablers which encouraged telehealth monitoring included the quality of the RNs and reassurance/security for participants. A Yarning Circle participant said, "She (the RN) has earned (sic) the right now to be accepted by this community". Others commented that if a reading was high the RN always followed up with them and, when necessary, took them to the GP or hospital. Participants noted that, when they go to the clinic, the GP usually only checks one thing (current presenting problem) but this system picks up anything that is going wrong, especially if there is a pattern over a number of days and "the RN is onto it".

A number of participants also said that they feel much safer since they have joined the project, because as well as seeing their results themselves they have the added reassurance of knowing that someone else is watching the results of the readings and will take action if that is indicated.

When that blood pressure goes up and my oxygen level goes low, I get really scared" (but then the RN phones her and she feels reassured). "I can walk away from that and just think, 'Oh, well, it's an off day but it might be better tomorrow.' But I've got someone backing me up (Participant 2).

Self-management of chronic disease is a primary aim of telehealth use and the increased awareness and understanding of their disease and what influenced their readings was evident among many of the participants. Examples included one man who thought that raw sugar was not 'real sugar' and another who thought that Minties were just mint; they were both taught to link their eating of these things to their readings.

Another participant said:

I know that when I have a couple of beers on Friday or Saturday, it (blood pressure) goes up. I've cut back on a lot of drinking because of that, because I'm a bit worried about the Monday morning blood pressure test (Participant 1).

A very positive outcome from the project was the support some participants received from the wider community to help them make good choices to support their health:

I've also given up the drinking. I still like going to the clubs and pubs, but I go on a Sunday afternoon. There's raffles and after that there's music on. ... Since I stopped drinking alcohol, I've had to look around for a drink to substitute it. ... You can get Zero Lemonade and it's got no sugar in it. When I got off the alcohol, I had to turn my life right around to suit me, not to suit the person behind the bar or anything like that. So I walked straight up to the president of the RSL club, because I know him, and I said, "X, get me Leeds (Zero) Lemonade." He didn't have it but he got it through a lady coming in. He said, "We've got your drink here." The other bar people, as soon as I come in now, they say, "Do you want a lemonade?" (Yarning Circle 2 Participant)

Having both choice and access through using the equipment was very important to some participants:

I got to a place where I've got a system and I appreciate that system because then I've got a choice, and choice is a big thing for me. It's about access. I don't have to go to the Elders' Health Check but I can if I feel like yarning up everywhere. That's how I see it. It's beneficial, it's really good. I love it (Yarning Circle 1 Participant).

A senior staff member at one of the Aboriginal Medical Services involved in the project said that that comment was "music to her ears" because she believes that choice and access are key aspects of the wellbeing of Aboriginal people.

Regular monitoring also picked up problems that had been missed by other health care providers. The wife of one participant said:

He was told that he had arthritis in his arms and shoulders. However, (the RN) could see from his readings that it was his heart that was causing the problem and she arranged for him to be treated for that. Although it is too risky for him to undergo surgery, he is able to keep a check of how he is going with the readings and it gives him reassurance that (the RN) is checking too (Yarning Circle 4 Participant).

Conclusions

Project outcomes included high levels of engagement with the technology by many participants, with the majority needing only three training sessions to become proficient at using the equipment. There was increasing compliance to monitoring vital health signs, notable health education and behaviour change, and high acceptability of use of the equipment (although some equipment needs to be more user-friendly). Almost all participants wanted to continue using telehealth.

Other lessons learned included: reliable and fast internet connection is critical for telehealth monitoring. Systematic review of monitoring plans could reduce the number of missed readings and better outcomes result when GPs and RNs work together.

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Presenter

Professor Colleen Cartwright was Foundation Professor of Aged Services and Director of the ASLaRC Aged Services Unit at Southern Cross University from 2005 until April 2014. She now is Principal Director of Cartwright Consulting Aust Pty Ltd. Professor Cartwright has extensive teaching and research experience in ageing, ethics and medical decisions at the end of life, at national and international levels, with publications in major journals and a number of book chapters. Much of her research and teaching over 22 years has been aimed at improving end of life care, including adequate pain relief, and ensuring that patients' wishes are respected. She has conducted a number of studies on improving the health and wellbeing of older Aboriginal people. Professor Cartwright regularly runs information and training sessions for community and health professional groups on ethical and legal issues relating to care at the end of life, including advance care planning, informed consent and capacity, issues for carers and the special challenges of caring for people with dementia.