Evaluation of a community-based SMS support program for cardiovascular patients from 2020 - 2024: The HeartHealth program

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Abstract

Background: The HeartHealth program is a six-month SMS message-based support program offered to patients with a recent cardiovascular hospitalisation or recent cardiovascular clinic visit in Western Sydney, Australia. Its customised content focuses on cardiovascular risk factors, with a focus on lifestyle, treatments and general heart health information.

Objective: This study aimed to evaluate the implementation of the HeartHealth program.

Methods: A mixed-methods study was conducted assessing program reach, effectiveness, implementation and maintenance using program data, participant feed-back surveys and staff focus-group discussions. Consecutive adult patients who had attended cardiology clinics or had been discharged from cardiology hospitalisation at Westmead Hospital, between April 2020 and April 2024 were included in the analysis. Content analysis was utilised to interpret the qualitative data.

Results: A total of 23095 patients were invited, 8804 (38.1%; 8804/23095) enrolled into the program and 7964 (90.5%; 7964/8804) completed the six-month duration. Participant mean age was 60.5 years, 60.5% were male, and 59.7% were recruited from an out-patient clinic setting. A total of 851058 SMS messages were sent with 99.41% being successfully delivered. 3533 participants completed the post-program survey and four HeartHealth staff members participated in a focus group discussion. 60.5% of participants reported the programming improving their regular vegetable intake and 53.6% reported improved physical activity levels. Content analysis of participant feedback identified that the program was effective in prompting participants to change diet, provided emotional support, reminded them of importance of behaviour change, improved their confidence in managing their health and kept participants focused. HeartHealth staff recommended that future program adjustments should expand program dissemination and improve program personalisation.

Conclusions: The program had a broad reach, translated to improved health behaviours, provided participants with needed support at low cost and low resource requirements. Key program barriers and future adaptions to long-term maintenance were identified, such as increased program personalisation, increased site staff involvement and wider program dissemination. This analysis highlights the successful implementation and scalability of the HeartHealth program and provides key learnings for health systems who are looking to implement similar programs in the future.

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Background

Patient education is an important element of the care of chronic disease patients and now several international agencies have a policy focus on improving patient education to support self-management [1-3]. Secondary prevention, both medical treatment and behaviour modification including regular physical activity, diet modification, smoking cessation, alcohol restriction and weight management, is highlighted in most cardiovascular disease (CVD) guidelines, but supporting CVD patients in these activities is challenging [4]. Most current health care models' education and support are typically delivered through in-person consultation and group activities, with limited access due to travel requirements[5], cost [6], time and lack of prioritisation [7]. In addition, many health care services lack the resources and funding to deliver these, and programs have limited ability to cater for population diversity [8] [9].

While digital technologies have been widely and aggressively implemented in retail and commercial sectors, utilisation in health care has been sluggish and recalcitrant. Digital health technologies present a scalable means to deliver customised patient education to overcome some existing barriers described above, and the COVID19 pandemic and associated lockdowns resulted in greater utilisation of mobile health (mHealth) technologies in health[10]. Several small to medium size randomised controlled trials (RCTs) have shown mHeatlh texting interventions to improve patient CVD risk factors including: LDL-C levels [11], BMI [11], blood pressure [12], weight management [13] and smoking cessation [14]. Furthermore, these interventions report high rates of patient satisfaction [15], and usability [11]. Yet despite the research to date there are limited examples of real-world implementation and evaluation of large-scale digital education and support programs for cardiovascular and other chronic diseases.

In April 2020, the HeartHealth program was initiated and offered to cardiovascular patients discharged from cardiovascular services or clinics in Western Sydney, NSW. The program provides personalised cardiovascular education and support via SMS through a digital customisation platform over a 6-month period and an opportunity to ask questions. This study aimed to evaluate the implementation of the HeartHealth program.

Methods

Heart Health Program description

The Heart Health program involved the delivery of regular semi-personalised cardiovascular education and support via SMS message for 6 months. The message bank was developed by clinicians, academics and patients and covered the following five modules: smoking, diet, physical activity, COVID-19 and general cardiovascular health. Messages were written to provide advice, education, motivation, and reminders aimed at improving cardiovascular risk factors and healthy lifestyle behaviours. SMS messages would often be supplemented with a URL link to a website to enable access to further information on the message content. Participants were able to opt-out of the program at any time through alerting staff through responding to the SMS messages. The program was built on the original TEXT ME program [11].

At registration participants completed a survey detailing their baseline characteristics (hypertension, diabetes mellitus, hypercholesterolaemia, smoking status and diet preference). Through application of algorithms, messages from the message bank that were relevant to the participant based on their baseline characteristics were selected and thus individual participant's programs were tailored on content. Messages addressed the participant by preferred name and provided the source of information, Supplementary appendix table 1 provides examples of messages.

To disseminate SMS messaging support programs at scale, our team at Westmead Applied Research Centre (WARC) built a cloud-based digital platform "TextCARE" that can deliver multiple programs according to varying clinical algorithms simultaneously. This hence enabled delivery of customised content to thousands of people concurrently. The TextCARE platform was utilised to implement the HeartHealth program which started at Westmead hospital in April 2020 and continues to be deployed.

Enrolment and eligibility

Patients were eligible for HeartHealth if they were ≥18y, post hospital discharge from a cardiology admission or had recently attended outpatient cardiology clinics. Consecutive eligible patients from the previous week were sent a single SMS message to enrol into the HeartHealth programs. For patients who did not respond to the SMS message, staff attempt ed to contact them by phone.

Study Design

This study adopts a mixed-methods design assessing the Heart Health program ‘Reach’, ‘Effectiveness’, ‘Implementation and Maintenance ‘. Three sources of data were collected: post-intervention surveys, focus group discussion with organisation staff and program-related data. Data sources used for analysis are outlined in Supplementary appendix table 2. This study was approved by the Western Sydney Local Health District Human Research Ethics Committee (Approval number: 2020/ETH01649).

Data Collection

Post-intervention surveys

All participants in the HeartHealth program were asked to complete an assessment survey at the end of the intervention, which was not compulsory (Supplementary appendix survey 1). The survey was designed by University of Sydney staff to evaluate the program, asking participants for feedback on the program’s impact, such as changes in lifestyle behaviours, what they enjoyed and what could be improved. The survey was distributed via REDCap.

Focus group discussion

All current HeartHealth staff members involved with the operationalisation of the Heart Health program were invited to partake in a focus-group discussion regarding the effectiveness, implementation and maintenance of the HeartHealth program.

Heart Health program data

From the onset of the Heart Health program, staff members recorded and stored data on participant outreach, enrolment, opt-out and responses to SMS messages. On a weekly basis, staff members would record, categorise and store the above data, enabling thorough and complete analysis on the reach and implementation components of our analysis. This data was stored securely on the University of Sydney RDS platform.

Data/statistical analysis

Statistical analysis was undertaken using R statistical software (V4.2.0). Categorical data, including quantitative survey data, program attrition data and participant demographic data are presented as frequencies and percentages. Qualitative data assessing participant and staff perspectives of program

barriers, enablers, areas of required adaptions, interaction with SMS messages and implementation of the program are analysed via content analysis [16]. One researcher (BS) familiarized themself with the data and inductively coded the data into themes and subthemes. Three researchers (BS, RT and LL) then reviewed and discussed established themes and subthemes, which were repeatedly adapted until agreement was reached on final theme and subtheme formation. HeartHealth participants were excluded from analysis if they did not complete the entire 6-month program duration.

Results

Reach

Participant enrolment

A total of 23095 patients, who had either attended a Westmead hospital cardiology clinic or were discharged from Westmead hospital cardiology unit between April 2020 and April 2024, were offered the Heart Health program. 14291 patients did not opt into the program and 8804 patients consented to participate in the program, (enrolment rate: 8804/23095, 38.1%). The majority of patients were invited to enrol in the program following an outpatient clinic review (59.7% vs 40.3%); consequently, the HeartHealth program cohort primarily consisted of patients recruited from a clinic setting. HeartHealth participants were slightly younger (58.6 years vs 61.7 years) compared to the non-enrollee patients, however the gender disparity between cohorts were similar (Table 2).

Table 2. Characteristics of participants who opted into the HeartHealth participants and those who did not opt in (Non-enrollees).

	HeartHealth Participants n=8804	Non-Enrollees n=14291	Overall n=23095
Age, years	58.6 (16.1)	61.7 (17.8)	60.5 (17.2)
Missing	12	10	22
Gender			

Male	5302/8788 (60.3%)	8647/14263 (60.6%)	13949/23051 (60.5%)
Female	3486/8788 (39.7%)	5616/14263 (39.4%)	9102/23501 (39.5%)
Missing	16	28	44
Site of recruitment			
Hospital setting	3242/8624 (37.6%)	5872/14013 (41.9%)	9144/22637 40.3%)
Clinic setting	5382/8624 (62.4%)	8141/14013 (58.1%)	13523/22637 (59.7%)
Missing	180	278	458

Effectiveness

A total of 3533 (40.1% of HeartHealth cohort) participants completed the post-intervention survey. The majority of participants reported the program was effective in helping them regularly eat vegetables (60.5%) and regularly exercise (53.6%). Content analysis of participant feedback identified that HeartHealth participants reported the program was effective in that it prompted them to change diet, provided emotional support, reminded them of importance of behaviour change, improved their confidence in managing their health and kept people focused (Box 1).

Box 1: Themes and sub-themes on participant benefits of the HeartHealth program

Theme 1: Program translated to effective health behaviour change
Initiating lifestyle change
“Extremely useful [Heart Health program], I’ve made changes to my lifestyle and feel I’m taking more control over myself”
“Thanks to your support I am now on the right path to getting better, I first thought I wouldn’t make next year. By slowly following the beginning of program and taking it slowly day by day. I didn’t have any blockages in my heart, but my [myocardial infarction] was caused through either trauma or stress, so I naturally sourced methods from your program to help me”.
“The program has prompted me to reduce my salt intake. While I already knew that salt should be reduced in our diets, it was useful being prompted about it and having suggestions on how to reduce salt intake.”
“I was overweight, I didn’t eat [many] vegetables, but now I do. I didn’t walk much, now I walk every day. This program has changed my [lifestyle].”
“I was pleased to be part of the trial which was a big factor in me losing 20KG and becoming fitter.”
“The only unhealthy thing about my lifestyle is smoking cigarettes, those text reminders did make me think about quitting though – so I guess that’s a positive.”

“The smoking messages encouraged me to quit smoking. 3 months [since I] quit.”
Empowering people to engage in self-management
“I found all the messages were very useful for me as it empowered me to do more activities, eat healthy, take my tablets and to stay healthy. I’m well and improved a lot beyond expectation. Thank you so much”
“After following this program I am confident I can follow through with the activities suggested and have healthy foods in the future for improvement to my physical health and internal health.”
“Most of the messages are useful and doable. I have gained a lot of important information necessary to maintain a healthy lifestyle.”
Reinforcement of healthy habits
“Short and sharp reminders helped me re-focus especially with regard to diet and exercise.”
“Good work. I’m glad I’m doing this program. Keeps me more conscious of my lifestyle and what needs improvement for a longer and healthier life.”
“The messages keep me focused, and I review them weekly just to make sure I am on track.”
Theme 2: Program supported patients psychological health and well-being
Provided participants with a sense of care
“I love the program. I’m single and live alone and it was nice to receive a message with helpful advice and it made me much less stressed, and I felt less alone.
“Was nice to get messages to know someone was caring and supportive through my new transitional time”
“The messages made me feel like there was someone checking on me and was steering me in the right direction”
“Great program. I felt that I had daily support/companion to manage my condition.”
Participant accountability
“Keep it going. It helped me so much and made me feel that I was cared for, there was someone looking out for me and it kept me on my toes.”
“It was a good program. It kept me informed of that I was supposed to do to stay healthy. A weekly reminder, at least, does not let you forget your obligations.”
Motivation and positivity
“The messages were good motivation. It’s easy to revert away from a healthier lifestyle and forget about my condition but the but the messages kept it front of mind.”

“I was glad to do it. It motivated me a lot. Kept on straight and narrow. I looked forward to receiving the massages. Thank you.”
“The increase in psychological safety was a direct result. This helped in keeping me focused and in a positive state of mind as I journeyed through regaining my health and amending my lifestyle”

Implementation and maintenance

Fidelity and attrition

A total of 851058 (average 97 per participant) SMS messages were sent between April 21 2020 and April 1 2024; 99.41% (846009/851058) were successfully delivered. Of the 8804 patients who participated in the Heart Health program, 840 did not complete the 6-month program (840/8804, 9.5%). In comparison to those patients who completed the intervention, the group of participants who did not complete the 6-month intervention were younger (56.89 [SD18.7] years vs 58.8 [SD15.8] years), more likely to be female (42.5% vs 39.2%) and had a lower prevalence of cardiovascular risk factors (hypertension; 38.3% vs 48.9%, hypercholesterolaemia; 35.2% vs 44%, and Diabetes mellitus; 17.9% vs 24.3%).

Resources and costs

The program was operationalised by four University of Sydney - WARC, staff members on a part-time basis, WARC: program manager, digital product manager, health administrator and research assistant, each with respective roles (Supplementary appendix table 3). The resources and corresponding yearly expenses required to operationalise the heart health program are outlined in Supplementary appendix table 4; the average cost per participant was $15.97 for the program duration

Participant program engagement

Participants could reply to the text or ask questions, it was not activity encouraged to reply, but program staff did monitor SMS message and respond as necessary. Across a total of 8804 people enrolled between April 2020 and April, 2024, 8288 responses were received. 73% of these responses were expressing thanks or acknowledging receipt of the message sent to them. The other 27% of responses were based on lifestyle behaviours or administrative content.

Barriers and enablers to implementing the HeartHealth program

From a participant perspective program enablers were the perceived valuable nature of the program content by participants in helping them change behaviours, the utility of the information to their own personal conditions and easy accessibility to this information through SMS and hyperlinks in SMS to their mobile phones (Table 2). In contrast barriers identified by some participants was that information was not personalised enough, the limited languages and lack of flexibility in delivery timing and the overly simplistic content (Supplementary appendix table 5).

Table 2. Participant enablers for implementing the Heart Health Program

Theme 1: Appropriate and valuable content was delivered
SMS content reinforced existing knowledge
“Most of the information I knew but liked getting the messages to reinforce my knowledge”
“All the texts were very helpful and from memory, some were repeated which was fantastic as it kept reinforcing the message if I had not taken on board what the message was telling me.”
SMS content provided awareness of their cardiac condition
“Messages were a reminder that despite feeling well I still have a chronic heart disease and need to take care about that.”
“The message content wasn't the most important to me as was the reminder that I did need to consider my cardio health overall.”
“The messages provided additional reminder/reinforcement of the need to pay regular attention to aspects of lifestyle that affect health and wellbeing particularly in the context of my medical conditions.”
“For a brief moment every day I was reminded to do all I could for my health. My heart is of great concern to me and I have learnt a bit with the resources you have recommended.”
Engaged with relatable information
“My favourite messages that explain a little about the science of heart conditions and how the text advice could assist with that”
“My favourite message was the one that described what happens to the body as a result of exercise in video format.”
“Symptoms of a heart attack or related heart disease the viewer could have & what to do.
“More points on how smoking alcohol and eating the wrong foods can damage your heart

and body”
Engaged with actionable advice
“I liked the ideas, suggestions and reminders to get me thinking about what I could do more than the more-prescriptive messages.”
“Diet messages about nuts and salad to avoid sugar and reduce cholesterol are very encouraging.”
“They were all good, some better than others. I liked the ones with actionable [information].”
Theme 2: Information was communicated in an effective manner
Frequency of SMS messages serving as consistent reminders
“I have been to Weight Watchers many times and know what I should do to keep healthy but unless you are getting somebody or a text message every day, you go backwards. The daily reinforcement is the key to my success. I want to thank you all for allowing me to be a participant as you have certainly made a difference in keeping me healthy and happy.”
“Extremely important educational information… However, the frequent texts reminders help to be mindful on following the diet, medication and exercise plan. Many thanks”
“The actual message was less important than the fact that they reminded me to be careful of diet and to exercise regularly.
Hyperlinks facilitated expanding knowledge
“My favourite messages were 'healthy type of facts' or ideas with hyperlinks. [This allowed] the recipient the option to investigate further.”
“I was interested in the messages that provided links to more detailed and comprehensive advice, particularly about salt intake.”
“In general the comments where helpful, however, some of the messages might have links for further help. E.g., There was a message which suggested using herbs to add flavour to reduce salt. Finding the relevant information was very hard to find. Actual suggestions or a link would have been a lot more helpful.”

From a HeartHealth staff perspective, program feedback aligned with participant survey feedback on the perceived program utility, benefit of SMS personalisation and ease of use. In addition, staff felt empowered and effective in their ability to manage and communicate with participants if issues arose (Supplementary appendix table 6). The main barriers perceived were lack of promotion of the program by local clinical staff leading to participants being unaware of the post-discharge program existence, and the limited digital health literacy or English literacy of some participants requiring

help with onboarding into the program from family or staff (Supplementary appendix table 7). Recommended future program adjustments were focussed around overcoming these barriers, expanding program dissemination, and improving program personalisation (Supplementary appendix table 8).

Adaptions made when implementing the Heart Health Program

Three key adaptions were made by the HeartHealth staff following program commencement. Firstly, efforts were made to increase '*Site staff program awareness'* through emailing to senior medical staff, presenting at departmental meetings, providing additional verbal and written education to all staff, placing posters in wards, clinics and frequented locations. Secondly, HeartHealth staff members made adaptions to *'Improve the enrolment process';* these adaptions aimed to improve patient understanding of the program and ease of enrolment through simplifying the initial enrolment SMS message and implementing a follow-up phone call to assist in this process where required. Thirdly, the SMS message content was continually adapted throughout the program to provide up-to-date information on COVID-19, guidelines, and cardiovascular health (Supplementary appendix table 9).

Discussion

Principal results

This paper describes the initial implementation and a detailed appraisal of an algorithm-driven personalised digital education and support program 'HeartHealth' for patients with heart conditions. Key learnings of this study were that: 1) The program was able to be implemented with high fidelity with relatively low resource-utilisation, 2) The majority of participants completed the 6-month program, with the 9.5% not completing more likely to be younger, female and with lower prevalence of CVD risk factors, 3) The majority of participants reported improved health and behavioural risk factors 4) Content analysis of feedback questionnaires indicated that program benefits were driven by improved self-efficacy, feeling psychologically supported and initiating healthy lifestyle behaviours and 5) Further personalisation and further engagement with local stakeholders could improve engagement and impact of the program.

Comparison with prior work

The program had a high reach of the target population who were offered enrolment within a 4-year

timeframe. The high rates of enrolment were likely facilitated by the simple method of enrolment and that patients may have been motivated to address their heart health because of their recent hospitalisation or clinic visit. Recent studies following a similar program structure by automatically obtaining eligible patient contact details, also equated in a large reach of patients [17, 18]. Patients approached from a clinic setting were more likely to enrol in the program. Clinic patients are likely to have fewer cofounding stressors and information burden in comparison to patients recruited post-hospital discharge, hence increasing their capacity to comprehend and subsequently enrol into the program. Previous community programs have demonstrated that an opt-out model opposed to an opt-in model can improve patient reach and enrolment. A single-centre oncology site demonstrated that a smoking cessation program using an opt-out model, compared to an opt-in model not only substantially increased the number of patients referred to the program, but also increased the number of patients accepting the referral, from 1 in 9 users to 1 in 3 users [19]. Opt-out models in cardiovascular rehabilitation programs have also shown significant increases in patients referred to the program compared to opt-in models [20, 21]. Future adaptions to the HeartHealth program are required to optimise enrolment rates; utilising an opt-out model may be effective option.

The content analysis of program participants provide multiple insights into the reasons for improved health effects from the program. These factors included a combination of direct and indirect factors – such as the psychological/ emotional support, continued light-touch connectivity, and increased self-efficacy improved patient experience and also encouraged positive behaviour change. These reasons align with prominent psycho-behavioural theories such as the theory of planned behaviour [22], social cognitive theory [23] and the self-determination theory [24], which should be further utilised when planning future program adaptions and dissemination. It is well recognised that providing emotional support is essential for patient centred care [25, 26] and when combined effectively with clinical care, positively increases the patient experience [27-29]. Through the HeartHealth program providing an avenue of continual support via the SMS messaging platform, participants were highly engaged with the program. Importantly many replies were a general comment or to say “thanks”, rather than utilising the program as a modality to report health concerns requiring a reply from the health counsellor, which is consistent with previous research [30]. This form of engagement provides patients with an increased sense of care and support without being resource intensive and demanding on staff workload. To continue delivering an effective program, it is vital to consider both the education content and the emotional support provided by the program when considering program adaptions.

The HeartHealth program was implemented with high program fidelity and low participant attrition rates. An important factor for the successful implementation was due to the simplicity of participation and wide acceptance of the program. The acceptance and useability of SMS programs have previously been demonstrated in other cardiovascular cohorts [11], as well as mental health [31, 32] renal [33] and diabetic cohorts [34]. Furthermore, HeartHealth staff reported that the successful implementation was partly enabled through an appropriate, easy-to-use program design, personalised patient contact upon program invitation and skilled, adaptive staff members. For example, an adaption initiated by staff members were to contact patients via a phone call to assist with enrolment if they had not responded to the SMS invitation, resulting in a large increase in enrolment. Previous studies have found self-enrolment to be a barrier for some patients, thereby highlighting the importance of providing assistance with enrolment or offering alternative enrolment modalities [35, 36]. It is important to note that despite the HeartHealth program being implemented as a hospital service, the majority of the staff involved were from the University of Sydney. The importance of engaging local clinicians in implementation was identified as a barrier. This is consistent with other observations of the implementation of new clinician services, with issues focussed around insufficient clinician time [37], lack of clinician motivation [38, 39], high staff turnover [40], lack of continuing education [37, 39], and an unsupportive organisational culture [37, 38]. Due to the program design and minimal resources required, adoption at further sites is likely to be high. However translational challenges may exist if the program is clinician-led, which need to be acknowledged prior to program implementation.

Participants identified that a lack of personalisation of both message content and delivery was a main program barrier. A common theme from participants was that ‘one size does not fit all’, with the information not always being relevant and the message timing and modality not suiting all participants. The need for content personalisation has been described previously in mHealth interventions among CVD populations [41, 42], studies comparing personalised with non-personalised content on clinical outcomes in cardiovascular populations is lacking [43], however benefits have been shown in smoking populations [44]. To increase participation, satisfaction and effectiveness, steps need to be taken to personalise content so that is relevant to participants and delivered in a way which suits the participant’s needs. Advances in machine learning and artificial intelligence will enable the development of SMS platforms to improve personalised content and respond appropriately to patient questions, aiding as a health companion [45]; future research into

the design and implementation evaluation of such programs is required.

To enable program sustainability and on-going improvements, adaptions are required. HeartHealth staff and participants highlighted that the program could be further supported by incorporating a communication channel with healthcare members to provide information and support when required. It has been shown that patients may feel overwhelmed and unguided on where to find trusted information with the rising tide of health misinformation [46]. Cardiovascular patients have previously reported that they want their doctor or nurse to recommend information sources [47]. Future research should assess the feasibility and impact on clinical outcomes of an interactive SMS messaging program prior to incorporating into the HeartHealth program.

HeartHealth staff highlighted that to have a wider impact, the program should be disseminated to other hospitals and departments. An important consideration with wider dissemination is the required cost and resources to implement the program. Whilst a comprehensive cost-effectiveness analysis of the HeartHealth program is required, previous community SMS messaging trials, using the TextCare platform were found to be cost-saving and health improving in cardiovascular [48] and diabetic cohorts [49]. SMS programs, utilising other SMS platforms have demonstrated program cost-effectiveness in renal disease patient [50] and in smoking cessation campaigns [51]. The cost per participant in the HeartHealth program was significantly less than traditional cardiac rehabilitation programs, which have previously been reported to cost between $631 - $1457 depending on the program setting (Hospital, home or remote) [52-54]. Overall, the HeartHealth program is likely to be appealing to other departments given the frugal nature of the program, participant benefits and low resource requirements needed to implement the program.

Limitations

There were limitations of this study. First, the post-intervention survey had a moderate response rate (40.1%), therefore feedback may not be representative of all participants. This response rate is in keeping with previous online surveys and may be attributable to survey fatigue during and after the COVID-19 pandemic [55, 56]. Second, whilst staff members called participants who had not responded to the initial SMS program invitation and obtained reasons as to why they did not enrol, we did not capture information from those participants who decline the initial SMS invitation, therefore limiting our interpretation of the program’s reach. Given the program having high

participant acceptability and low resource requirement to implement the program, evaluating long term program maintenance, awareness and funding sources will be pertinent for wider dissemination.

Implications

The adoption of mobile health technologies has significantly risen over recent years, which can largely be attributed to the COVID-19 pandemic, a heightened focus on telehealth, and the increasing burden on healthcare services [57]. SMS messaging programs within cardiovascular populations have shown to be an effective modality to improve cardiovascular health; however, to date there has been few that have proceeded to large-scale implementation and a formal scientific evaluation. This study demonstrates the feasibility and utility of implementing personalised post-discharge support at low cost. It also identifies important enablers and barriers to implementation. Future scale-up should consider further customisation of programs to individuals and broadening availability through personalised to language and health literacy.

Conclusion

This thorough implementation evaluation highlights the successful implementation of the HeartHealth program. Participant attrition and perceived lifestyle benefits demonstrate the program effectiveness, additionally, staff and participant feedback has highlighted key program barriers and enablers. These insights provide key learnings for future scale-up and improvement of HeartHealth post-discharge digital support.

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Abbreviations:

RCT: randomized controlled trial

CVD: cardiovascular disease

RCT: randomised controlled trials

WARC: Westmead Applied Research Centre

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Supplementary Files

Multimedia Appendixes

Examples of SMS messages used in the HeartHealth program.
URL: http://asset.jmir.pub/assets/b4e77639eb1dddc787aa844f234bd08e.docx

Implementation evaluation outcome measures and data sources.
URL: http://asset.jmir.pub/assets/7ec332550162768c22d21a7202078435.docx

Roles and duties of Heart Health staff.
URL: http://asset.jmir.pub/assets/1bad984c1ad35d26f54067b5325ff727.docx

Program set-up and maintenance costs.
URL: http://asset.jmir.pub/assets/10d926bbe231796368f76899cce2d9a0.docx

Participant barriers for implementing the Heart Health Program.
URL: http://asset.jmir.pub/assets/1684f264f7407d697be0bf63f1410952.docx

HeartHealth staff enablers for implementing the HeartHealth Program.
URL: http://asset.jmir.pub/assets/37c815f5793dc02cc31d116ae10e2563.docx

HeartHealth staff barriers for implementing the HeartHealth Program.
URL: http://asset.jmir.pub/assets/f07332697c8bd71c3680c57a31ef6dbd.docx

HeartHealth staff recommended future adaptions for implementing the HeartHealth Program.
URL: http://asset.jmir.pub/assets/81575b5de0e6c0fad18fad3957a05776.docx

Organisation adaptions made to implementing the Heart Health Program.
URL: http://asset.jmir.pub/assets/531db122c7d85138893208c8f25e3e05.docx