A Service Evaluation of V Heart Health

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Executive Summary

Introduction: The aim of this work was to conduct an evaluation of V Heart Health, a digital cardiac rehabilitation programme for patients with multimorbidity. Whilst the traditional (face-to-face) cardiac rehab programme is considered the 'gold standard' it is important that there is a menu of options available for patients and V Heart Health seems well placed to form part of this.

Methods: Quantitative and qualitative methods of data collection were utilised including adherence (usability) data, routinely collected clinical data and patient satisfaction feedback. A staff focus group was conducted to explore staff perceptions with regards to the delivery of V Heart Health.

Results: The collection of routine clinical data was successful where data were collected by clinicians via phone or video call. Where the onus was on patients to complete and return questionnaires and feedback forms there were some missing data. It is important that this is addressed as completeness of data and patient feedback are essential to ensure service development and improvement. The feedback from patients with regard to the programme content and the staff involved in the delivery was positive. Findings from the focus group indicated that staff felt the programme was successful and they were keen to continue developing and improving the service. They reported keeping patients at the heart of all future decisions and emphasized that V Heart Health should continue to form part of a suite of options for patients. Some of the issues described in this early rollout phase included challenges securing an appropriate venue (during COVID 19 lockdown), awareness and knowledge of wider team about V Heart Health and concerns about digital literacy within the county. Factors perceived as facilitators included staff development, IT support and teamwork. There were technology and connectivity issues described by patients that need to be explored and addressed as a priority going forward.

Conclusion: it is important to offer patients choice, to include site based, home, online or blended programmes on an equitable basis with the aim to improve uptake across a range of patient groups. There are areas for development of V Heart Health described within this report which are already being explored as the programme is continuously evolving in response to feedback and staff are becoming more confident and competent in its delivery. V Heart Health has the potential to form part of the menu of programme options for patients living in Lincolnshire. This initial evaluation demonstrates preliminary proof of concept and acceptability data for V Heart Health, however further evaluation and research is warranted.

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1.0 Introduction

Cardiac rehabilitation (CR) programmes are designed to provide a range of lifestyle and medical interventions to reduce cardiovascular mortality and morbidity through the promotion of a healthy lifestyle, psychosocial well-being and subsequent reduction in risk factors. A wealth of evidence-based studies has proven the patient benefits of CR (Anderson et al., 2014). Despite CR being a well-established intervention, only 50% of the eligible population take up the offer to attend (NACR 2018). Poor uptake has been attributed to several factors, including physicians' reluctance to refer some patients, particularly women and those from ethnic minorities or lower socio-economic classes, as well as, lack of resources, capacity, and funding. Adherence to cardiac rehabilitation programmes is affected by factors such as psychological wellbeing, geographical location, access to transport, and a dislike of group-based rehabilitation. Offering patients, a choice of centre based, home, online, or blended programmes on an equitable basis is likely to improve uptake across all groups of cardiac patients (BMJ 2015).

Multimorbidity is a growing global health concern, and multimorbidity interventions are considered a priority (Bratzke et al., 2015). People with multimorbidities typically have low physical activity levels (Steeves et al., 2019), associated with worsened all-cause mortality, disease burden (Lee et al., 2012), poorer health-related quality of life (Bize et al., 2007) and report mental health problems (Chekroud et al., 2018). In the UK in 2015, 54% of those aged over 65 years have a multimorbidity, which is expected to increase to 68% by 2035. Lincolnshire is a large rural county with an ageing population, some areas of significant deprivation and a large transient population in the summer. In addition to the complex healthcare needs of this population there are issues around access to services because of impaired mobility and limited transport infrastructure. To better support the Lincolnshire population wishing to engage in CR the Lincolnshire Community Health Services NHS Trust (LCHS) have developed a digital adaptation of the traditional cardiac rehabilitation programme to address the needs of patients with multimorbidities. The development of this initiative aims to overcome some of the barriers that residents experience in accessing services by reducing the need to travel, particularly in the rural and coastal parts of the county.

V Heart Health the Lincolnshire digital CR programme which livestreams group exercise sessions to patients in their own home is made available via a digital application or an 'app'. Patients are offered the gold standard conventional programme, but this may not always be suitable for them for many reasons and barriers. The home based live streaming programme aimed to offer a six-week live streaming exercise and education programme facilitated by a cardiac rehabilitation physiotherapist, cardiac rehabilitation nurse and a cardiac rehabilitation practitioner. The programme is personalised and patients can set their own goals which may be more suitable to this specific population. Each week has a different exercise session with planned targets for progression. Additional educational podcasts are made available that cover all aspects of recovery and lifestyle change as well as signposting to other support services.

The intention is to offer the app to those with at least one co-morbidity who are unable to attend the conventional programme or those who need to access a programme as soon as possible for

emotional and physical support. The value of a menu of options that incorporates digital has of course been recognised in-light of the COVID 19 pandemic where face-to-face provision is limited or has simply not been possible.

LCHS have commissioned a team of researchers from the Lincoln International Institute for Rural Health (LIIRH) at the University of Lincoln to undertake this evaluation report aiming to provide preliminary evidence to underpin and inform the development and delivery of V Heart Health.

2.0 Methods

2.1 Ethical Approval

A favourable ethical opinion was granted on October 2nd 2020 by the University of Lincoln Human Ethics Committee (REF: 2020_3741)

2.2 Aims and Objectives

The primary aim of this work was to conduct an evaluation of V Heart Health.

This was a commissioned service evaluation aiming to address a set of core questions with regards to service delivery:
- Can live streaming a cardiac rehab programme with educational podcasts form part of a menu of exercise and education options for patients?
- Will patients be able to access and engage in the online cardiac rehab program?
- Will additional resources be required (i.e staff time, technology support) to ensure successful continuation of this program?

To do this we:
- Recorded rate data collection for the routine clinical outcomes usually collected pre and post 'conventional' cardiac rehab
- Presented preliminary findings of the magnitude of effect pre and post V Heart Health to begin developing proof of concept data
- Collected usability data, such as number of logins, successful calls, compliance with exercise
- Reported patient satisfaction data using standard tool adapted for the V Heart Health program to include free text boxes to collect additional patient feedback comments (included open ended comment section)
- To explore program delivery from the staff perspective we conducted an online focus group with LCHS staff.

2.3 Design

The team collected both quantitative and qualitative data to inform this evaluation.

Patient inclusion criteria:
Referred to the CR service
Presence of at least one other co-morbidity (i.e. diabetes, heart failure)

2.4 Adherence and usability information

Data were collected with regards to the number of sessions logged on to, sessions attended and completed, with reasons for missing sessions (did not attend [DNA] vs internet/technology). The number of additional clinical and technical support calls made to patients was also recorded.

2.5 Routine data collection measures

Patient Satisfaction Questionnaires (PSQ) were emailed to all patients, these would previously been completed face to face during the last session of the traditional programme (Appendix 1). These were adapted to capture data focusing on the digital delivery of the programme. There were a series of Likert scale statements and each item included an option for additional comments with open ended suggestions at the end of the questionnaire.

Dukes Activity Status Index (DASI) is an assessment tool used to evaluate the functional capacity of patients. This was completed over the phone or video consultation pre and post V Heart Health.

The PHQ-4 is a questionnaire answered on a four-point Likert-type scale. Its purpose is to allow for a brief and accurate measurement of core symptoms/signs of depression and anxiety. A score of three or more on the depression or anxiety sub scales should be further evaluated and/or a mental health referral should be made. This questionnaire was completed via phone or video consultation pre and post V Heart Health.

Therapy Outcome Measures for Rehabilitation (TOMS) provides a summary description of the relative abilities and difficulties of a patient in the four domains of impairment, activity, participation and wellbeing in order to monitor changes over time. This measure was completed by a clinician pre and post V Heart Health.

2.6 Staff focus group

Members of the team involved in the coordination and delivery of the V Health Programme were invited to attend an online focus group. Focus group participants were invited by a Cardiac Rehab Assistant who through discussion with the wider team identified a range of professionals with different roles in the development and delivery of the service. The focus group lasted approximately 60 minutes and was conducted via Microsoft Teams online video conferencing

software. The meeting was recorded and transcribed verbatim by a member of the research team. The focus group data was thematically analysed by two members of the research team (FC and DN).

3.0 Results

3.1 Participant characteristics

Nine patients enrolled on the programme, five males and four females. Their age ranged from 38 to 85 years old (mean±SD: 60.6±16.8 years). Reasons for referral were Nstemi (n=3), chronic heart failure, cardio myopathy, personalised external aortic root support procedure, cardiac arrest/STEMI, Elective PCI, and ablation/AF. Patient recorded comorbidities were asthma, hypertension (n=4) hypercholesterolemia (n=2), hyperthyroidism, anxiety (n=2), arthritis, heart failure (n=2), cancer, heart failure AF (n=2), diabetic (n=2). One patient did not attend any sessions and was reported as 'dropped out' for health reasons. A second patient was also reported as 'dropped out', however this patient did provide data for the evaluation as they completed one session and attempted another three which failed due to IT/internet.

3.2 Adherence data

Not all the patients (n=4) had equipment to access the V Heart Health programme and needed to loan iPads from the service. Out of a total of 56 possible sessions across all participants, 24 (43%) sessions were completed. There were 17 (30%) not attended and 14 (25%) failed because of IT/internet failure (appendix 3). Seven out of the eight patients needed technology support calls during the sessions (20 calls in total) and all had at least one clinical call (15 calls). Only three of the patients accessed the app in addition to the live sessions for additional exercise sessions (2, 6, and 1 sessions).

3.3 Routine clinical outcome results

Patients logged onto 36 sessions, with 24 of those successfully completed. Of the 36 that were started by patients, 25 (69%) pre exercise questionnaires, and 21 (58%) post exercise questionnaires were completed.

The collection of routine clinical outcomes (PHQ4, DASI and TOMS) was achieved via the telephone or video consultation. Data (mean±SD) are presented in figure 1 for patients who attended the programme and completed pre and post questionnaires demonstrating a favourable direction of effect for routinely collected clinical outcome data post V Heart Health.
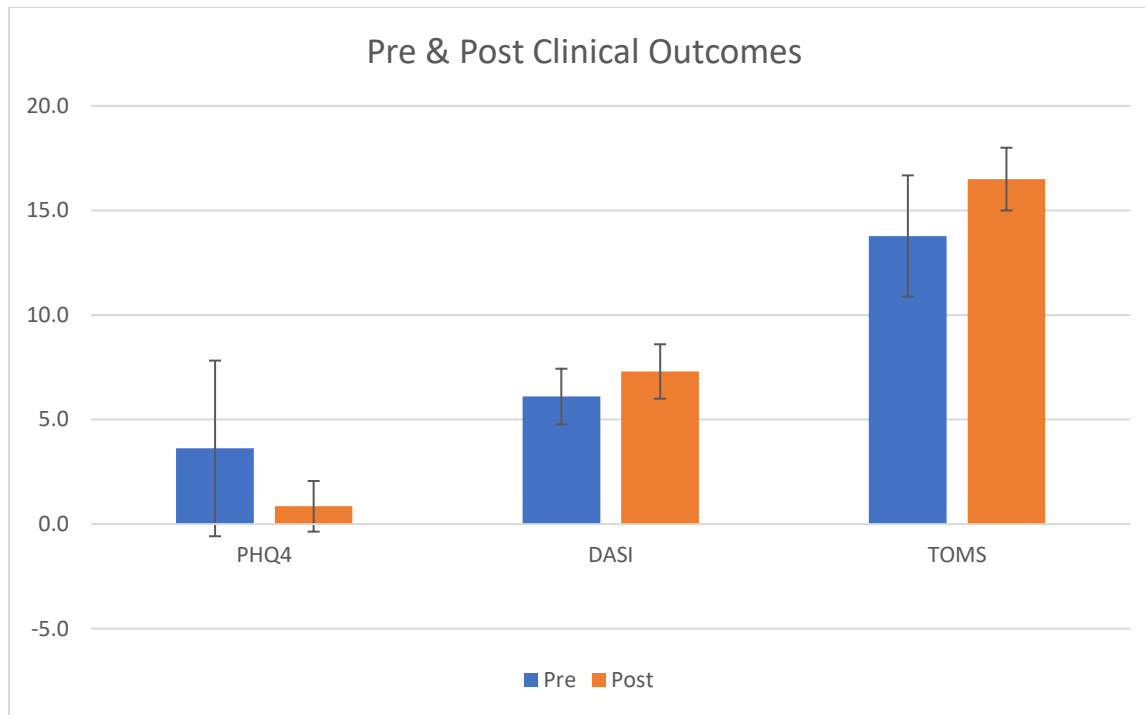
Figure 1: Pre and Post routinely collected outcome measures

3.4 PSQ data results

Five patients returned their PSQs; two returned paper copies, one completed online, one was reported as just 'completed' and a final PSQ was completed by the patient's daughter. Of those not returned, two patients were recorded as 'drop outs', and two did not return their PSQs despite follow up requests.

Likert scale items and responses for 5 patients who completed PSQ (figure 2):

1. There was enough pre-programme information about how to use the app.
2. There was enough pre-programme information about what to expect during the exercise and education programme.
3. The app was easy to use.
4. The live streaming easy to follow.
5. I felt I could interact easily with the staff delivering the programme during the livestreaming.
6. The programme worked well with the number of people that attended.
7. During my consultation with a Community Cardiac Rehabilitation Nurse I was actively encouraged to discuss my goals & individual needs for my rehabilitation
8. I received clear information about my Community Cardiac Rehabilitation care & treatment
9. I was treated with dignity and respect at all times by the Community Cardiac Rehabilitation Team.
10. I was treated with kindness and compassion by the Community Cardiac Rehabilitation Team.
11. The digital exercise and education programme was as good as the face-to-face programme

Figure 2: PSQ Likert Scale Responses

PSQ item	Strongly Agree	Agree	Neither Agree/Disagree	Disagree	Strongly Disagree
1	1	3		1	
2	3	2			
3		3		1	1
4	2	2		1	
5	1	2	2		
6	3	1	1		
7	3		2		
8	3	2			
9	4	1			
10	4	1			
11				1	

Overall, the patient responses were favorable with most strongly agreeing or agreeing with the positive statements presented. Some neither agreed or disagreed with some of the statements, with fewer selecting disagree or strongly disagree. Where responses were less positive and additional feedback was provided in the form of written comments it would appear that issues were related to technology (e.g. internet connection, hardware and software issues) and in some cases it was suggested that being elderly may not be compatible with this digital format.

The patient who selected disagree for statement 3 (the app was easy to use) described difficulties with the technology: "*Not easy at all and had a lot of technical issues in the first couple of weeks of the programme".* They also disagreed with the statement 'the live streaming was easy to follow' stating: "*Not really easy for the elderly. The sound and picture quality on the livestreaming was not very good and the whole process was difficult for an elderly person to comprehend"*. WiFi issues were also highlighted as an issue by another patient. Four patients strongly agreed (2 patients) or agreed (2 patients) with this statement with one patient providing further information: "*The content and delivery were excellent as far as I was concerned. There was always evidence of responding to individual needs within the group, by name if appropriate. Front view and side view demonstrations worked well as complimentary reference point"*.

Where neither agree or disagree was selected for the statement 'The programme worked well with the number of people that attended' it appeared to be an age related issue: "*just not easy for an old person to follow*"

Whilst a patient agreed with the statement "I could easily interact with the staff delivering the programme during the life streaming" they did go on to described some issues with connectivity/technology stating: "*Loss of sound was an issue last week. I could hear the others in the group but not Jenny. I could still follow through and enjoyed the session*".

There was only one response to item 11 asking patients to specify on the Likert scale how the digital V Heart Health program compares to the traditional face to face. They disagreed that the digital program was as good as face to face, supporting this with a qualitative comment: *"The*

face to face programmes will always provide a richer learning and social environment with the bigger group. The digital exercise is far more dependent on the client being able to accept the technical format and adapting to it. The social aspects are also more limited i.e. solo in ones own lounge as opposed to face to face experience."

Four of the five patients felt that the podcasts were clear and concise (from yes/no/NA). However, usability data indicated that only 3 patients used the additional app option demonstrating errors with completing the questionnaire.

On the whole, patients reported positive experiences of the digital service delivered by the cardiac rehabilitation team. All patients felt that yes (compared to no/unsure), they were given information on how to contact the team. Four patients rated the availability and support of the team as excellent (from: excellent/good/average/poor/very poor), and one good. When asked 'How likely is it that you would recommend Cardiac Rehabilitation to friends and family, if they needed this service?' all patients bar one selected extremely likely (extremely likely/likely/neither likely or unlikely/unlikely/extremely unlikely/don't know). One patient selected unlikely; however the choice appears to be age related in the context of digital delivery: '*Wouldn't recommend to older people'*.

Patient preference for cardiac rehab programme delivery format pre-pandemic and during COVID 19.

Patients were asked (with 1 representing preferred option):

1. What would you have chosen for your cardiac rehabilitation activity **before** the COVID 19 pandemic?
2. **During** this current Covid pandemic what would be your preferred choice for your cardiac rehabilitation activity?

Figure 3: Ranking of patient preference for program delivery before and during COVID 19

preference	Face to face Programme		V Heart Health		Home Programme		Own form of activity	
	Before	**during**	**before**	**during**	**Before**	**during**	**before**	**during**
First	3	1	0	0	1	2	0	0
Second	1	1	1	1	1	0	1	2
Third	0	0	0	0	2	2	1	0
Fourth	0	0	2	1	0	0	2	2
Unclear	1	3	2	3	1	1	1	1

Patients did not all complete this PSQ items correctly, two placed crosses and question marks next to V Heart Health (before and during) and one an exclamation mark for face to face in place of ranking scores. Some also left options blank indicating the need for clearer guidance and instructions. These have all been ranked as unclear in the table above.

Three patients indicated they would have preferred a face to face programme before COVID 19 compared to one patient selecting face to face during COVID 19, who stated: *With such small*

numbers a face to face programe may be able to run. One patient ranked face to face as their second option before and during COVID 19.

None of the patients appeared to have selected V Heart Health as their first choice before or during COVID 19, however, it is possible that the 'unclear' rankings may have chosen V Heart Health. It is likely that the cross represented a first-choice selection as the other ranking options were left blank. In the case of the question marks, all other rankings were completed for that patient except third, so it may be the question mark was meant to be a third choice, or it could indicate that a patient did not know what V Heart Health was. V Heart Health was the least preferred option (fourth) for 2 patients before COVID 19, and for one during.

There was a small shift for patients preferring the home programme or own activity during COVID 19 compared to their preference before. The home programme was the preferred option for one patient before, and two during COVID 19, and third choice for two patients before and during COVID 19. Own activity was the least preferred option being fourth for two patients before and during COVID 19. It was third choice for one patient before and for two during the pandemic.

Optional free text feedback

Feedback obtained here was in the context of the COVID 19 lockdown. One patient stated that they would have preferred face to face CR, however, it is important to remember that this program was developed to form a menu of options and not as an alternative.

There were some technology issues identified during this evaluation as evidenced by some of the patient comments, one patient wrote: 'Additional investment in the technology to assist the great team would be good. Better cameras, and broadcasting equipment would probably help them.' Another stated 'Would Zoom have been a simpler and more reliable platform for the delivery?' but did go on to say 'there has always been impressive technical support throughout (offer of an iPad/"tech guy" joining to help).' One patient described how V Heart Health was dependent on the user being able to accept and adapt to using technology effectively. Another individual described some of the issues around accessing and using Virtu care, 'I only have 5 tiles to access, but when watching the video in getting started, there looked to be more…. I have then tried on 2 laptops … I am missing out on some information' which clearly illustrates some of the technology issues experienced by some.

Whilst there was an interactive and social component within V Heart Health, some patients still felt this was somewhat lacking when envisaging what could be possible when compared to face-to-face delivery, one participant commented 'There is comfort in a face to face gym session with a bit of banter and shared experience.' and 'The face to face programme will always provide a richer learning and social environment with the bigger group.' Another individual also reported 'social aspects are also more limited i.e. solo in one's own lounge as opposed to face to face experience.'

Based on the feedback it was clear that patents appreciate the care delivered within this service; 'what a team, what a help and they are life savers. I then had someone to talk to, someone who understood and someone to help.' Additional positive comments about the team and programme more broadly: 'Without this programme, I would not have got this and as such been in a far worse place regarding my physical and mental wellbeing.' And 'Congratulations to all who went to so much trouble putting this program together and to deliver it to such high standards.' And finally 'They are a great team and a credit to the NHS and I will be eternally grateful for what they have done for me.'

3.5 Staff Focus Group results
A total of six participants took part in the online focus group discussion.

Name	Role
Mo Bullen	Cardiac Rehabilitation Nurse Specialist/Team Lead
Saffron Gee	Digital Project and Training Officer
Jennifer Gipp	Cardiac Rehabilitation Specialist Physiotherapist
Helen Beesley	Cardiac Rehabilitation Nurse Specialist
Paula Groves	Cardiac Rehabilitation Practitioner
Alison Bunn	Cardiac Rehabilitation Nurse Specialist/Team Lead

Focus group data has been reported as themes in relation to barriers and/or facilitators to the delivery of the digital cardiac rehabilitation service. The themes are described below and evidenced by key participant quotations. Firstly, we report on the general experiences of the team with regards to delivering V Heart Health.

General Staff Experiences of V Heart Health

Overall, staff experiences of delivering V Heart Health were mostly positive. One participant felt that initially delivering the service digitally was 'completely out of their comfort zone' but despite some of the ongoing challenges, the team have adapted and learnt as the service has been rolled out and it has continued to improve over time. Clinicians often noted how they seen reciprocal value in delivering the service as when patients were benefitting from the service this also gave them great satisfaction too.

The team remain optimistic and positive about the future of digital delivery despite a number of challenges. There were ambitions for a wider rollout of the programme taking a blended approach (face-to-face and digital) with increased capacity that would then accommodate a range of different people and backgrounds. Although it was acknowledged that for this to be successful the team would need to collect further data on user experience to ensure that any changes are informed by evidence and service users' needs. The team maintained that throughout delivery they have 'always kept the patient at the centre' of all decisions that have

been made and so they have a desire to collect further patient feedback data beyond the scope of this evaluation.

One of the clinicians felt that they were 'moving with the times' by making services available digitally and that this would perhaps be more accommodating to people who are economically active and are unable to access the face-to-face programme due to other life commitments. A senior member of the team also felt this was important as the patients that are currently getting referred are 'getting younger all the time' and are in need of timely support without delay.

Despite some of the barriers that are reported on below, the team felt that the service appears to be meeting its primary aim of providing and improving access to the service for patients who cannot attend the face-to-face programme by facilitating group exercise in their own homes.

The team also commented that the service has been mostly received positively by the patients who they said they had 'absolutely loved it' and in some cases, participants noted that the patients on the digital programme tended to be more open, less self-conscious and more likely to ask for help when compared to their experiences of face-to-face delivery. Furthermore, there was the perception that patients understood the exercises quicker via digital delivery because they are more focused and can see themselves on the screen of their device. Although it should be noted that senior staff were honest in that they felt there was some elements of participation bias where existing patients have self-referred and committed to the programme, so their motivation levels are likely to be higher compared to others who have not self-selected.

3.5.1 Barriers to delivery of V Heart Health
Three themes in relation to barriers were identified (1) Venue (2) Awareness and Understanding from Wider Team About V Heart Health and (3) Digital Literacy

Venue

Staff noted that getting a suitable venue was a considerable challenge both pre and during the Covid-19 pandemic. Prior to the pandemic, the team would often have to put in additional work to try and source community venues across the county. After several unsuccessful attempts to source a suitable community venue, a local rugby club agreed and was used for the pilot which worked well, however, following the national lockdown and government restrictions, this venue was no longer available. Following the lockdown, the team were eventually able to source an education room on trust premises, but it proved difficult sharing this room with other colleagues due to limited availability. There was a perception that sourcing a room for the digital provision of care would not be as difficult as for face-to-face, however, this was not the case as stated below:

> *"Venues are always a challenge. We thought because we were doing this virtually, it wouldn't be a challenge! Surely, we can use some meeting rooms in the NHS, we have*

loads of offices! We expected it not to be a challenge, but it normally always is a challenge."

Awareness and Understanding from Wider Team About V Heart Health

It was acknowledged that perceptions of V Heart Health from the wider team can sometimes be that the service is disorganised and chaotic when this is perhaps not always the case. There was a perception that the wider team lacked confidence and knowledge about the digital element of the service. The participants detailed that for the service to be sustainable and to grow there needs to be more than the current core team advocating for and delivering it. Therefore, it was suggested that colleagues across the trust need to make a conscious effort to engage and understand the service:

"But I do think that the wider team need to get to grips with it and understand what their team members are delivering, and to be a part of it and to be a champion for it as well."

Digital Literacy

It was acknowledged that as an organisation, LCHS need to recognise the digital deficit across Lincolnshire. It was reported that some patients were using outdated devices, had no wi-fi or poor connectivity, with some individuals still using pay as you go mobile phones making connecting to the internet problematic. Additionally, staff commented that some patients struggled with using and navigating the livestream, as well as knowing how to access and use different web browsers that might improve functionality. It was noted by some of the clinicians that the app itself that is currently being used was not the most accessible or user friendly. There was the perception that some patients were nervous about engaging with the IT side, particularly at the beginning of the programme. Although these anxieties tended to decrease or go away over time. For things to progress, it was recognised that staff and patients' need to be more familiar with the digital technology and that it should work easily on multiple platforms and devices. The team also reported that on one occasion there were some sound issues where two patients could not hear them on the call. Finally, there was the perception that digital access and literacy issues were not being dealt with quickly enough to meet the increased supply of services:

"We are pushing out all of these digital services everywhere and not everybody can access them. We are still having the same access issues as you would driving 30 miles for your clinic appointment, it is almost the equivalent but digital. So, I don't think that is recognised, or being addressed quickly enough at the rate we are developing and delivering services digitally."

3.5.2 Facilitators to the delivery of V Heart Health

With regard to facilitators, three themes were identified (1) Staff Development (2) IT Support (3) Teamwork

Staff Development

Senior staff commented that there have been wider benefits to the development of the clinicians both as individuals and within their team. They stated:

> *"This is a massive thing to put on your CV. And it is not just words, they have all developed those skills; digital, communication, innovation, it has been brilliant to watch their staff development, it really has. But we need to do training with the wider team, which we will."*

IT Support

The need for specialist IT support to troubleshoot technical issues was noted as integral to the service by staff and there were positive reports where the technical team had visited patients in their own homes to support them with IT problems.

Additionally, the team were successful in obtaining funding to provide patients with digital devices, such as iPads, as reported below:

> *"We did use funding, for iPads to give them out to patients. We have tried to solve that Lincolnshire deficit so patients can reach us who maybe don't have a device. We don't want that to be a barrier, so we are trying to be as inclusive as possible."*

Teamwork

Non-clinical staff detailed the importance of having a strong and supportive clinical team to deliver the service and senior staff praised the work ethic of the clinicians who were delivering V Heart Health, for example:

> *"Those three clinicians with all of that passion, enthusiasm and confidence, those three members of staff are pulling this through and making this shine and we are just backing up with the technical side basically."*

Furthermore, it was acknowledged that the service would not have been as successful without support from the wider team across the trust and county who ensure that patients are receiving other components of LCHS services. Some participants commented that they were grateful to have the opportunity to work with professionals outside of their own professional background, for example:

"So I love the team work and I love that fact that we have got to work across other services as well. You know, we are all a bit blinkered in our own professions, and to work with different professionals, so even the university team, work with digital health and other services, it has been brilliant. So, lots of positives."

Given the situation with the pandemic, some participants detailed that they had really enjoyed working together in a team again and also seeing how clinical staff were able to grow and have confidence to communicate with senior colleagues at the trust:

"I have enjoyed working in a team again. A lot of us have been working in isolation, obviously because of Covid, but the teamwork aspect is fantastic. And there hasn't been hierarchy in this team. I know we all introduced ourselves, the hierarchy, at the beginning, but actually when they are doing it, and I see these girls in meetings, (name removed) is talking to directors the same way I am talking to a director. That has been fantastic and has enabled the growth. I could never have done the project on my own."

4.0 Final comments and recommendations

4.1 Characteristics of CR patients
The characteristics of patients referred for cardiac rehabilitation can vary significantly which is an important consideration when tailoring interventions for patients (Al Quait & Doherty 2016). The patients enrolled on this programme had at least one other comorbidity and their ages ranged from 38 to 85 years old. Although CR is a proven intervention in reducing cardiovascular mortality and morbidity there is concern that CR programme delivery may not yield comparable outcomes across age groups. The feedback from patients combined with the usability data presented here suggest that age related issues with regards to familiarity and competence engaging with technology may introduce inequalities in how patients are able to access this service. Additional resources may be required to support digital literacy of patients wishing to access V Heart Health. It is recommended that:
- Up-front discussion with potential participants with regards to technology expectations. Clearer instructions which could include the development of an information pack to include guidance for internet access, suitable devices, installation of V Heart Health.
- Signposting to training and support resources

4.2 Adherence and usability recommendations
Technology and internet issues were common during the delivery of this programme with 20 technology support phone calls to patients logged. Furthermore, some patients did not have adequate devices to access and engage with the service. Recommendations to address this include:
- Staff training.

- Identifying and resolving technology issues.
- Development of patient information packs for technology and the internet.
- Provision of digital devices such as IPads for patients where necessary.

4.3 Collection of clinical outcomes for completeness of data

There was variation across outcomes with regards to completeness of data collection. Pre and post program measures (DASI, PHQ4 & TOMS) were successfully collected and reported, however there were some missing pre and post exercise session questionnaires. To ensure the collection of routine clinical data it is recommended that:

- Data is collected via telephone or video link where possible.
- System prompts at login.
- Text and/or phone call reminders.

4.4 PSQ to inform service evaluation and improvement

Meaningful, high quality and timely patient feedback is essential for service improvement. Whilst there was a reasonable return for PSQs (five), there were some errors in how patients completed these questionnaires. Patients referred to the programme by different names and as such they may have been uncertain about the name "V Heart Health" in the feedback questionnaires. Also, some patients felt that V Heart Health did not achieve all the social interactive benefits that they thought could be experienced as part of the traditional face to face CR. It was clear that patients valued the service provided and for some a digital platform would be an acceptable and welcomed alternative option to face to face if IT issues were resolved. To increase return rate and reduce errors in completion it is recommended that:

- The team provide instructions over the telephone or during livestreaming session just as they would for the 'traditional' programme.
- Clearer instructions are provided within the questionnaire to include reformatting text.
- Follow up phone calls where PSQs are not returned
- Clearer programme branding
- Addition of break out rooms to allow for small group discussion.
- Addition of a user led WhatsApp group to facilitate group interaction/cohesion.

4.5 CR service staff experience and perceptions

Staff involved in the development and delivery of V Heart Health felt the initial programme roll out had been successful and were optimistic about the potential for wider rollout increasing the menu of options for patients. They described keeping the patient at the centre of all decisions made and believed this increased capacity would accommodate a range of different people and backgrounds. Whilst there were a number of challenges experienced (predominantly IT and internet related) they felt it was achieving its primary aim of improving access to patients by facilitating an interactive, group, home based exercise programme. Some barriers described included identifying and securing appropriate venues which is often challenging and requires additional consideration with regards to video equipment and high-quality internet access. The

service also secured digital devices to loan to patients who did not have the appropriate technology to access the programme. Key facilitators to delivery were identified as suitable IT support, ongoing staff development and teamwork. As this programme continues to evolve it is recommended that:

- Channels of communication within the team are maintained for continued evaluation.
- Mechanisms for informing the wider team about V Heart Health are defined.
- Staff development opportunities are recognized and optimised.
- Ensuring technology is fit for purpose.
- Ensuring appropriate venues for digital delivery.
- Digital literacy is better understood and addressed.

4.6 Future research

Whilst this programme was broadly well received by both patients and staff, future research needs to explore and understand a larger number of patients experiences, in more depth, as there were some areas of the feedback that lacked clarity. In addition to the broad age range of CR referrals, the increasing number of patients presenting with comorbidities is an important consideration for future research. Increasing physical activity levels in people with multimorbidities is a key health priority (Parker et al., 2019), potentially resulting in a range of health-related improvements for patients (Chudasama et al., 2019) and as such any future work should incorporate measures of physical activity. To advance this programme of work it is recommended that:

- Ensure technology is fit for purpose.
- Additional or extended sessions are incorporated into the schedule to ensure clear guidance for completeness of data that can be utilised in future evaluations.
- Objective measures of physical activity are included (e.g. heart rate monitor, actigraph).
- Subjective measures of physical activity exertion to feature more prominently (e.g. Borgs ratings of perceived exertion).
- Further ongoing quantitative and qualitative data collection with patients and staff to increase the sample size.
- Pilot/feasibility study to inform a future trial (non-inferiority 2 arm patient preference trial: V Heart Health vs traditional CR)

4.7 Conclusion

Whilst further evaluative research needs to be conducted as this programme of work develops, V Heart Health, has the potential to enhance the provision of CR for patients across Lincolnshire. There are times when digital delivery may have to form a core element of CR service delivery because of further lockdowns and social distancing measures. As such the continuous development and improvement of this programme should be considered essential for both the provision of services in line with patient preference , but also as an essential service if there are further government restrictions. There were numerous ICT issues, however many of these have been, or are now, being explored and addressed by the team. V Heart

Health has the potential to overcome some of the barriers associated with the traditional face to face programme, such as reducing the need to travel long distances, which is particularly pertinent given the rurality of Lincolnshire .

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Appendix 1 PSQ

Our Ref: Vitrucare2020

LCHS Research Cardiac Rehab
Vitrucare Project
Bourne Health Clinic
St Gilbert's Road

Telephone: 01778 425124
E-mail address: LHNT.CardiacRehab@nhs.net
Website:

Bourne,
Lincs, PE10 9XA

Dear

Patient survey of Lincolnshire Community Health Services NHS Trust
Cardiac Rehabilitation Nurse Specialist Service digital service delivery

Please find enclosed questionnaire/s about your experiences of the digital Cardiac Rehabilitation Service that you have recently accessed. We would be grateful if you would take a few minutes to complete only the questions that apply to the service you have received.

It is our intention to provide the highest standard of care and your timely feedback from these questionnaires will enable us to identify areas that may need improvement. Your opinions are therefore very valuable.

Please return these questionnaires within 14 days via email, or if you wish to remain anonymous via post in the pre-paid envelope provided.

If you have any queries regarding the survey, please contact the Cardiac Rehabilitation Team.

Yours sincerely

Cardiac Rehabilitation Team

Evaluation Questionnaire of Digital Cardiac Rehabilitation Services

Your feedback is important to us. All comments are noted and used to provide our staff with feedback as well as to help us develop improved services in the future. All information provided by you is treated in the strictest confidence and will only be used for the purposes stated.

If you have any difficulties filling out the form or would like to receive this questionnaire in another format or language, please contact a member of our team on **01778 425124**

Below is a series of questions and statements. Please rate your response by putting a tick in the relevant box. There is also space for you to provide some additional feedback comments, good or bad, what you think could be better, all comments are welcomed. If there is not enough space below for your comment, please add an additional page.

Thank you in advance for your time.

1) There was enough pre-programme information about how to use the app.

Please tick one box

Strongly Agree	Agree	Neither Agree/Disagree	Disagree	Strongly Disagree

Comment

2) There was enough pre-programme information about what to expect during the exercise and education programme.

Please tick one box

Strongly Agree	Agree	Neither Agree/Disagree	Disagree	Strongly Disagree

Comment

3) The app was easy to use.

Please tick one box

Strongly Agree	Agree	Neither Agree/Disagree	Disagree	Strongly Disagree

Comment

4) The live streaming was easy to follow.

Please tick one box

Strongly Agree	Agree	Neither Agree/Disagree	Disagree	Strongly Disagree

Comment

5) The instructions from the staff were clear during the livestreaming.

Please tick one box

Strongly Agree	Agree	Neither Agree/Disagree	Disagree	Strongly Disagree

Comment

6) I felt I could interact easily with the staff delivering the programme during the livestreaming.

Please tick one box

Strongly Agree	Agree	Neither Agree/Disagree	Disagree	Strongly Disagree

Comment

7) The programme worked well with the number of people that attended.

Please tick one box

Strongly Agree	Agree	Neither Agree/Disagree	Disagree	Strongly Disagree

Comment

8) The podcast was easy to use.

Please tick one box

Strongly Agree	Agree	Neither Agree/Disagree	Disagree	Strongly Disagree

Comment

9) The information in the podcasts was informative and useful.

Please tick one box

Strongly Agree	Agree	Neither Agree/Disagree	Disagree	Strongly Disagree

Comment

10) During my consultation with a Community Cardiac Rehabilitation Nurse I was actively encouraged to discuss my goals & individual needs for my rehabilitation.

Please tick one box

Strongly Agree	Agree	Neither Agree/Disagree	Disagree	Strongly Disagree

Comment

11) I received clear information about my Community Cardiac Rehabilitation care & treatment.

Please tick one box

Strongly Agree	Agree	Neither Agree/Disagree	Disagree	Strongly Disagree

Comment

12) I was treated with dignity and respect at all times by the Community Cardiac Rehabilitation Team.

Please tick one box

Strongly Agree	Agree	Neither Agree/Disagree	Disagree	Strongly Disagree

Comment

13) I was treated with kindness and compassion by the Community Cardiac Rehabilitation Team.

Please tick one box

Strongly Agree	Agree	Neither Agree/Disagree	Disagree	Strongly Disagree

Comment

14) Were you given information on how to contact the Community Cardiac Rehabilitation Team?

Please tick one box
Yes ☐   No ☐   Unsure ☐
Comment

15) How likely is it that you would recommend Cardiac Rehabilitation to friends and family, if they needed this service?

Please tick one box

Extremely Likely	Likely	Neither Likely/Unlikely	Unlikely	Extremely Unlikely	Don't Know

Comment

16) How would you rate the availability and support of the Community Cardiac Rehabilitation Team?

Please tick one box

Excellent	Good	Average	Poor	Very Poor

Comment

17a) Do you consider yourself to have a disability?

Yes ☐   No ☐

If yes what is the nature of your disability?

17b) Does your disability affect your use of the Cardiac Rehabilitation service?

Yes ☐   No ☐   Not applicable ☐

If yes please provide information in respect of any difficulties you have encountered.

If you have previously attended a face-to-face cardiac rehab programme, please answer the following question.

18) The digital exercise and education programme was as good as the face-to-face programme.

Please tick one box

Strongly Agree	Agree	Neither Agree/Disagree	Disagree	Strongly Disagree

Comment

19) What would you have chosen for your cardiac rehabilitation activity <u>before</u> the COVID-19 pandemic?
Please number your choices 1-4 with 1 being your first choice.

Face to face exercise programme	V Heart Health	Home Programme	Own form of activity

20) <u>During</u> the COVID-19 pandemic what would be your preferred choice for your cardiac rehabilitation activity?
Please number your choices 1-4 with 1 being your first choice.

Face to face exercise programme	V Heart Health	Home Programme	Own form of activity

21) How is the COVID-19 pandemic affecting your recovery?
Comment

22) Do you have any suggestions or further comments for improving the digital Cardiac Rehabilitation service?
Comment

When completed, please return this questionnaire via email, or if you wish to remain anonymous via post in the pre-paid envelope to the Community Cardiac Rehabilitation Team.

Thank you for taking the time to complete this form.

Appendix 2 Changes currently underway and future considerations

- Completed 3 cohorts in process of completing 2 more.
- Developed pre/post exercise questionnaires.
- Sending out SMS messages prior to exercise session and prompting to fill in the questionnaires.
- Safety prompts now a PowerPoint presentation.
- Embedded use of the DASI/TOMS/PHQ4 in wider countywide team. This is now used as routine as part of all pathways for patient care.
- Use of teams for video call rather than the many to many.
- We have built our skill base with supporting patient with digital literacy (as well as supporting other staff)
- Have a bespoke dedicated room for online exercise
- Equipment for the digital clinical room has been escalated and will be getting sound proofing/larger tv/better network
- As a result of the work and demand for the digital clinic room, a second digital room is being made in the south of county.
- We are now delivering education sessions at the end of the exercise session using screen sharing.
- Band 4 role has expanded to give 1-2-1 support sessions with patient as needed for digital coaching, accessing/using platform as well as clinical support
- Have been upskilling wider team with being able to deliver VHH
- Developed competencies for staff to work towards with VHH- again this has been shared to use in the wider team for other areas of service/new starters.

- Have now got a dedicated phone line for patient on the VHH programme to support them more.
- Supplied a mifi to patient to support to access platform
- Teamwork has developed into a non-hierarchical team dynamic which is encouraging all team member to upskill and develop and leading to better patient care.
- Able to offer a more flexible service as patient can be released from work for an hour
- Can offer a multitude of patient pathways, i.e., online exercise with support, video of exercise with support or education from platform only.
- Been able to reduce social isolation and support mental wellbeing with group session
- From a work perspective, some normality for staff to be able to deliver group exercise
- Strengthen core team values
- Implement service development change
- Admission avoidance with ability to give regular support
- Able to work countywide to given patients remote access to same service
- Reduction in staff and patient travel cost
- Reduction in cost for hiring venues for face-2-face (unable to do due to covid)
- Staff development
- Networking within out Trust to find the correct person for the specific task

Appendix 3 Session logins, connectivity and questionnaire return rate data

Sessions started	Completed sessions	UTA/DNA	Connectivity/ internet	Pre exercise Qs	Post exercise Qs	Returned PSQ
7	6	0	1	6	5	yes
4	4	3	0	2	4	Yes
7	4	0	3	6	4	requested
5	3	2	2	2	2	yes
5	3	2	2	2	2	yes
2	2	4	0	4	2	requested
4	1	3	3	2	1	yes
4	1	3	3	1	1	Dropped out